



## Applied Business and Information Technology (ABIT)

# 1. Program or Unit Description

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## Program Mission

The Applied Business and Information Technology (ABIT) program prepares graduates to be successful entrepreneurs, technology professionals and knowledge workers in today's global economy and environment. The ABIT program is within the mission of the UH Maui College, offering a four-year degree that emphasizes high quality instruction and project-based learning. This document describes the progress achieved by the program and an Action Plan for the next decade.

## Value of Degree

The ABIT program provides a bachelor's in applied science (BAS) degree to students who are either interested in pursuing higher education in graduate studies or would like to enter the workforce as a system analyst, business analyst or software engineer. Students can pursue their options based on their career and personal interests and goals.

Typical Career Pathways for students who do not pursue a graduate degree:

1. Business Analyst
2. Systems or IT Analyst
3. Human Resources Analyst
4. Cybersecurity Analyst
5. Help Desk Support Technician

Typical Graduate degree programs pursued by students who graduate with an ABIT BAS:

1. Master's Degree in Business Administration (MBA)
2. Master's Degree in Human Resources Management (MHRM)
3. Master's Degree in Educational Technology (MEdTech)
4. Master's Degree in Information Technology and Security (MSIT)
5. Master's Degree in Computer Science (MSCS)

## Highlights of ABIT graduates

Here are highlights (obtained from public LinkedIn profiles) from past graduates of the program -

1. Sunny Cabello - Class of 2007, graduated from the first class of the ABIT program, pursued MBA after ABIT, currently faculty at the University Center at UH Maui College
2. Lauren Kodani - Class of 2010, pursued MS in Ed Tech after ABIT, currently Instructional Designer and faculty at UH Maui College
3. Shawna Pawangit (Martin) - Class of 2012, pursue MS in Human Resources Management, worked in HR dept., currently works at UH Maui College as Title IX/EEO/AA Coordinator
4. Shawn Coad - Class of 2014, went on to obtain an IT analyst position at Four Seasons IT HQ in Denver, CO. Currently Director of IT at Four Seasons, Nashville, TN
5. Michelle Heller - Class of 2015, currently a business owner of Benjamin Moore Paint Store in Kahului, Maui. Went on to start her own business after graduation, in business for 7 years

6. Jeremy Bac - Class of 2015, went on to pursue a master's degree in cybersecurity from the University of Washington, currently an Information Security Specialist at T-Mobile in WA
7. Gwen Gabumpa, Class of 2016, went to pursue a career in finance and banking at American Savings Bank and BoA. Currently, an Escrow Assistant at Old Republic Title, in Maui, HI
8. Kuulei Alameida - Class of 2018, among the first graduates of the ABIT program from Molokai. Currently a HR Manager on Molokai, working for Na Puuwai
9. Jenna Sampaio – Class of 2019, is now a Certified Salesforce Administrator at Allotech Solutions LLC, in the San Diego, CA area
10. Lorraine Osako - Class of 2019, went on to obtain employment as a Software Test Engineer at the Pacific Disaster Center in Kihei, HI. Currently, working for the Westin Hotels, Maui
11. Kimo Goo - Class of 2020, currently a Territory Manager for Techtronic Industry (TTI) Group in Houston, a maker of contractor tool equipment
12. Brian Leeper, Class of 2020, formerly a medic at Bassett Army Community Hospital in AK, is currently a Quality Assurance Engineer at the Pacific Disaster Center (PDC) in Kihei, HI
13. Song Xi Lei – Class of 2022, transferred into ABIT from KapCC, currently working on a contract as a Customer Service Consultant for First Hawaiian Bank in Honolulu, HI
14. Kody Haleamau Rubio – Class of 2022, transferred into ABIT from HawCC, currently working at the Subaru Telescope Naoj atop Mauna Kea, as a Computer Systems Associate
15. Alec Bayer –Class of 2022, transferred into ABIT from ECET at UHMC and graduated at the top of his class. Currently works as a Program Specialist at Malama Aina Foundation

### **Certifications from Credit Courses**

While pursuing the ABIT degree, students can take relevant ICS courses to pursue the following cybersecurity security certifications which are well recognized in the cybersecurity industry. While the ABIT program does not track the students who take the certification exams, the program does provide incentives in the form of reimbursement for exam fees through the UH Foundation. It is possible to obtain funding from Perkins to reimburse students for exam fees and relevant expenses.

The following courses lead to industry certifications in cybersecurity -

- Course ICS 169 – leads to Security, Compliance, and Identity Fundamentals Certificate from Microsoft
- Course ICS 184 - leads to CompTIA certification in Network +
- Course ICS 171 - leads to CompTIA certification in Security +
- Course ICS 281 - leads to EC-Council certification in Ethical Hacking

In addition, the ABIT program also embeds the following career certificates as term projects –

- MKT 300 – Digital Marketing and E-Commerce Career Certificate from Google
- ICS 320 – IT Support Career Certificate from Google
- BUS 310 – Data Analytics Career Certificate from Google
- ICS 360 – Azure Data Fundamentals from Microsoft
- ICS 385 – UX Design Career Certificate from Google
- ICS 418 – Project Management Career Certificate from Google

### **New - Cybersecurity Certifications from Professional or Continuing Education Courses**

Due to the continuing demand for Professional or Continuing Education in the field of cybersecurity, the ABIT program plans on offering “non-credit” or continuing courses starting Fall 2023. These compressed eight-week courses will comprise both credit and non-credit students. Ideally, this program will enable working professional with little to no background in cybersecurity to diversify their skills and obtain entry-level positions through internship and apprenticeship opportunities. This series of four courses will lead to a Certificate of Competence in Cybersecurity and will provide training and incentives to complete certifications from CompTIA and EC-Council. This 32-week accelerated program will be taught by faculty from UHMC and lead to 48 CEUs.

1. ICS 169 – Information Security (Microsoft) – 8 weeks – Fall 2023 – first half – 12 CEUs
2. ICS 184 – Networking (Network+) – 8 weeks – Fall 2023 – second half – 12 CEUs
3. ICS 171 – Computer Security (Security+) – 8 weeks – Spring 2024 – first half – 12 CEUs
4. ICS 281 – Ethical Hacking (CEH) – 8 weeks – Spring 2024 – second half – 12 CEUs

### **Designation of CAE-CDE by NSA and DHS**

In April 2019, the ABIT BAS degree was designated by the National Science Agency (NSA) and Department of Homeland Security (DHS) as a Center of Academic Excellence (CAE) for Cyber Defense Education (CDE). This designation lasts 5 years through 2024 and provides the ABIT students with a network of cybersecurity institutions, opportunities for internships and employment in the cybersecurity industry, and opportunities to obtain certifications that are relevant and useful.

The CAE-CDE program has also provided the ABIT program and UHMC with the opportunity to pursue extramural grants from the National Science Foundation and the NSA. More information can be found at <http://maui.hawaii.edu/cybersecurity>. The current/pending grants include the following -

- NSA GenCyber Award for Summer Teacher Workshops - \$150K, 2021-2023
- NSA GenCyber Award for Summer Teacher Workshops - \$150K, 2022-2024
- Sub-award for teaching NSA RING Cybersecurity Curriculum to HIDoE - \$125K, 2023-24
- Currently applied for NSA ATE program grant for \$600K, decision in late spring 2023

The NSA/DHS designation of CAE-CDE for the ABIT BAS program allows ABIT graduates to obtain a certificate from the NSA and DHS upon graduation and completion of all four upper division ICS courses in addition to ICS 169. Since May 2019, the following eight ABIT students have obtained the certificate. More students are expected to obtain this certification in May 2023.

1. Kuulei Alameida - 2019
2. Nels Romerdahl - 2019
3. Laureen Osako - 2020
4. Brian Leeper - 2020
5. Kimo Goo - 2020
6. Lauren Kiang - 2020
7. Bjorn Lindqvist - 2020
8. Kody Rubio - 2022

### **Applied Research under ABIT**

The focus on entrepreneurship and cybersecurity, given the CAE-CDE designation by the NSA and DHS, has helped the ABIT program to pursue applied research projects in cybersecurity and computer science education within the State of Hawaii. The ABIT program has received \$2M in extramural funding since 2010 from the NSF and NSA. Recent past projects include the following:

- Computer Science Education for public HS teachers in Hawaii - funded by NSF C-STEM grant [Award No. 1738824](#) through September 2021. Project provided opportunities for ABIT students and UHMC faculty to conduct applied research in computer science education - training teachers with wide backgrounds to teach AP CSP in their classrooms
- Cybersecurity Workforce Development and Training in Hawaii - funded by NSF ATE grant [Award No. 1700562](#) through July 2021. Project provided opportunities for ABIT students to conduct paid internships with the PDC and with UHMC Program Coordinator. UHMC faculty were able to attend summer workshops for four years and learn about cybersecurity.

Currently, the UH Office of Innovation and Commercialization is the recipient of a sub-award of \$1M from the NSF for the training of research teams within UH Manoa and the UH Community Colleges in entrepreneurship using the Lean Launchpad Methodology (I-Corps). This funding will be utilized by student teams from the ABIT program in partnership with researchers from UHM.

### **Target Student Population**

The ABIT program offers both lower and upper-division courses to all students. The ABIT program serves a diverse student population, many of whom are first generation college students. The program also adjusts to traditional and non-traditional students, many of whom hold part-time jobs while completing their educational degree. The ABIT program is structured so that students can complete their entire degree over a four-year period. However, many students take longer to complete this degree based on personal and professional constraints and commitments.

The ABIT program is an established distance learning program which makes it available to distance learners outside Maui County. As such, the ABIT degree is now available to all students in Hawaii.

### **Articulated Pathways into ABIT BAS from UHCCs**

The ABIT BAS program is a 4-year program and has articulated pathways based on Memorandum of Agreement (MoAs) with the following Associate Degree programs in UH community colleges -

- Kapiolani Community College – AS in Information Technology
- Leeward Community College – AS in Information and Computer Science
- Honolulu Community College – AS in Computer, Security and Networking Technology
- Hawaii Community College – AAS in Information Technology

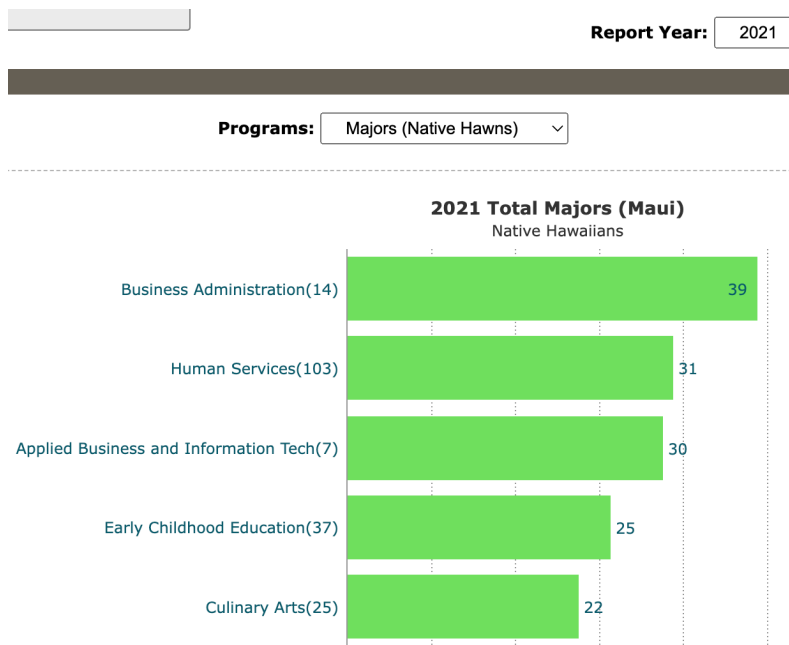
The program also works with the University Center locations in Kauai and Palamanui Campus. Currently, the ABIT program has 4 students from Kauai and 6 students from Hawaii County. The University Centers at Palamanui and Kauai will be active partners with the ABIT BAS in future.

## Closing Equity Gaps

The ABIT program caters to non-traditional students who come from a variety of backgrounds. The median age of the ABIT student is 26 years old and many students work full-time jobs. The proportion of Native Hawaiian students has grown over the past three years, as shown below.

- 2019-20 - # of Majors Native Hawaiian – 21
- 2020-21 - # of Majors Native Hawaiian – 30
- 2021-22 - # of Majors Native Hawaiian – 31

The graph below displays the Native Hawaiians in various UHMC programs, with ABIT at #3.



The ABIT program provides all its upper division students with opportunities for online education. In addition, ABIT provides tuition at affordable rates, with the following rates for students -

- Lower Division ABIT courses - HI Residents - \$131 x 61 credits - \$7,991
- Upper Division ABIT courses - HI Residents - \$306 x 60 credits - \$18,360
- In addition, ABIT provides students from Pacific Island nations and Western Undergraduate Education (WUE) regions with tuition rates that are 1.5 times that offered to HI residents.

Finally, the ABIT program offers student support services that accommodates the learning needs of adult and non-traditional learners. With the successful placement of ABIT graduates with local and mainland employers, the ABIT program intends to close the diversity and equity gaps within students in the local community. The ABIT program comprises most women students, with a significant representation of Native Hawaiian and students of Filipino descent. This increasing trend in student enrollment and growth indicates that the ABIT program is effective in targeting and mitigating issues and concerns with diversity, equity, and inclusion.

## 2. Analysis of the ABIT BAS Program

For the 2022 Review Year, the ABIT BAS program has an overall health status of **Cautionary**

### Overall Program Health: **Cautionary**

**Workforce Alignment:** Classification of Instructional Programs (CIP) -to- Standard Occupational Classification (SOC)

**Applied Business and Information Tech**  
CIP Code = **52.0799**

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11-9198 - Personal Service Managers, All Other; Entertainment and Recreation Managers, Except Gambling; and Managers, All Other

### Demand Indicators – Insufficient Data at County Level

#	Demand Indicators	2019 - 20	2020 - 21	2021 - 22
1.	New & Replacement Positions (State)	0	0	0
2.*	New & Replacement Positions (County Prorated)	0	0	0
3.	Number of Majors ?	72	91	104
3a.	Number of Majors Native Hawaiian	21	30	31
3b.	Fall Full-Time	53%	64%	58%
3c.	Fall Part-Time	47%	36%	42%
3d.	Fall Part-Time who are Full-Time in System	11%	0%	7%
3e.	Spring Full-Time	47%	60%	64%
3f.	Spring Part-Time	53%	40%	36%
3g.	Spring Part-Time who are Full-Time in System	10%	5%	5%
4.	SSH Program Majors in Program Classes	447	501	471
5.	SSH Non-Majors in Program Classes	369	456	357
6.	SSH in All Program Classes	816	957	828
7.	FTE Enrollment in Program Classes	27	32	28
8.	Total Number of Classes Taught	17	18	15
<b>Demand Health</b>		<b>Needs Attention</b> Insufficient Data County Level		

The above data indicates the following highlights and challenges -

- The new and replacement state and county positions for the CIP Code 52.0799 have not been reported in the ARPD. As a result, it is not possible to evaluate the demand for the program for the 2021-22 period. However, in the 2020-21 period in the previous report, it showed a demand of 317 state positions and 28 county positions. Assuming that number is unchanged, the demand for ABIT graduates is assumed to be **Healthy**.
- In contrast to the open positions, the number of ABIT majors has grown during the pandemic, from 72 in 2019-20 to 91 in 2020-21 to 104 in 2021-22. This is largely attributed to the introduction of online classes that are flexible and adaptable to working students.



2022 Maui Community College ARPD  
Program: Applied Business and Information Technology (ABIT)

- In contrast to the rise in Number of Majors in 2021-22 (104), there is a decline in SSH in All Program Classes from 957 in 2020-21 to 828 in 2021-22. This implies that students are doing less courses per semester or on an average, doing three courses or 9 credits per semester. Also, the % of Fall Full-Time students has dropped from 64% in 2020-21 to 58% in 2021-22. All this indicates that more ABIT students are opting to do part-time studies

It should be noted that ABIT is the second most popular major at UHMC for AY 2021-22.

Program Title	Type	3. Majors	3a. Majors Native Hawn	3b. Fall Full-time	3c. Fall Part-Time	3e. Spring Full-time	3f. Spring Part-Time	8. Total Classes Taught	9. Avg Class Size
Liberal Arts	GPP	790	240	32%	68%	26%	74%	383	17
Applied Business and Information Tech	CTE	104	31	58%	42%	64%	36%	15	18
Business Administration	CTE	87	28	46%	54%	52%	48%	19	20
Natural Science	GPP	82	22	32%	68%	24%	76%	21	14
Nursing: Associate Degree	CTE	72	19	55%	45%	18%	82%	48	12
Culinary Arts	CTE	70	18	59%	41%	61%	39%	39	11
Creative Media	CTE	62	10	43%	57%	27%	73%	23	15

### Efficiency Indicators – Progressing

#	Efficiency Indicators	2019 - 20	2020 - 21	2021 - 22
9.	Average Class Size	16	18	18
10.*	Fill Rate	64.5%	72.8%	74.2%
11.	FTE BOR Appointed Faculty	2	2	1
12.*	Majors to FTE BOR Appointed Faculty	36	46	104
13.	Majors to Analytic FTE Faculty	36	46	52
13a.	Analytic FTE Faculty	2	2	2
14.	Overall Program Expenditures	\$145,478	\$145,588	\$131,998
14a.	General Funded Budget Allocation	\$138,152	\$144,294	\$129,235
14b.	Special/Federal Budget Allocation	0	0	0
14c.	Tuition and Fees	\$7,326	\$1,294	\$2,763
15.	Cost per SSH	\$178	\$152	\$159
16.	Number of Low-Enrolled (<10) Classes	3	2	1
	<b>Efficiency Health</b>	<b>Progressing</b>		

The ABIT program lost one FT faculty in early August 2020 and had to rely on lecturers and other staff for the entire duration of the AY 2020-21. Based on that fact, it is unclear how the Number of



Analytic Faculty remains at 2. In any event, the Cost per SSH remains low at \$159 per SSH. Given that a credit at Resident rate costs \$131 for lower division courses and \$306 for upper division courses, ABIT is a profitable program! Increasing fill rates and decreasing number of low-enrolled classes indicates that ABIT is an efficient program with an average class size of 18 students.

### Effectiveness Indicators – Healthy

#	Effectiveness Indicators	2019 - 20	2020 - 21	2021 - 22
17.	Successful Completion (Equivalent C or Higher)	80%	82%	83%
18.	Withdrawals (Grade = W)	22	19	24
19.*	Persistence Fall to Spring	76%	69%	75%
19a.	Persistence Fall to Fall	52%	51%	51%
20.*	Unduplicated Degrees/Certificates Awarded ?	13	9	13
20a.	Degrees Awarded	13	9	13
20b.	Certificates of Achievement Awarded	0	0	0
20c.	Advanced Professional Certificates Awarded	0	0	0
20d.	Other Certificates Awarded	0	0	0
21.	External Licensing Exams Passed <sup>1</sup>			
22.	Transfers to UH 4-yr	28	44	33
22a.	Transfers with credential from program	16	14	15
22b.	Transfers without credential from program	12	30	18
	<b>Effectiveness Health</b>	<b>Healthy</b>		

The Effectiveness indicators above imply that the ABIT program is in a “healthy” status. This implies that ABIT students continue to persist from Fall to Spring. Some key notes are as follows:

- The Persistence from Fall to Spring has increased from 69% in 2020-21 to 75% in 2021-22. This implies that students are committed to the entire AY and return to classes in Spring.
- The Completion rates are consistent over the past 3 years, but Withdrawals number increased to 24 in 2021-22.
- A key metric for Effectiveness is the graduation rate for ABIT students. This has risen to 13 in AY 2021-22 from 9 in AY 2020-21. ABIT continues to strive to increase graduation rates.
- Given that ABIT is a BAS program, it is uncertain what the metric for transfers “with credential” from program implies. However, it is comforting to note that the transfers “without credential” has declined to 18 in 2021-22 from a high of 30 in 2020-21.

As shown in the figure below, ABIT is consistent in the number of classes offered in a distance modality. The Fill Rate for distance classes remains high and this is an increasing trend for ABIT.

2022 Maui Community College ARPD  
Program: Applied Business and Information Technology (ABIT)

#	Distance Indicators	2019 - 20	2020 - 21	2021 - 22	
23.	Number of Distance Education Classes Taught	6	15	14	
24.	Enrollments Distance Education Classes	106	279	271	
25.	Fill Rate	61%	73%	75%	
26.	Successful Completion (Equivalent C or Higher)	76%	82%	83%	
27.	Withdrawals (Grade = W)	10	15	24	
28.	Persistence (Fall to Spring Not Limited to Distance Education)	75%	78%	78%	

The ABIT program was approved by the WSCUC accreditation committee as a distance program in 2018 and can reach the entire state of HI. ABIT employs hybrid courses, where there is one contact hour of live synchronous classes to distance learners and one contact hour for asynchronous online learning. This hybrid mode of instruction is delivered via distance learning tools such as Zoom, directly to a student's laptop or to a learning center within the UH system. All upper division ABIT courses are now offered to distance students, or to students who are not able to commute in person to the Kahului campus. This has allowed the ABIT program to be delivered to students outside Maui County, including students from Oahu and all neighbor islands.

The ABIT program provides counseling and support to these students outside Maui County. The ABIT counselor keeps in regular contact with students outside Maui County and the ABIT Program Coordinator makes regular trips to Kapiolani CC and Molokai Education Center to confer and coordinate with the students. During the Covid-19 pandemic starting in March 2020, all courses in the ABIT program have transitioned to an online modality. This has allowed distance students to participate on equal terms with students from Kahului. Currently, ABIT faculty adopt a mix of synchronous and asynchronous online modality to teach students from all over the state.

The ABIT program maintains a baseline of an average of 10 graduates over the past three years.

#	Performance Indicators	2019 - 20	2020 - 21	2021 - 22	
35.	Number of Degrees and Certificates	13	9	13	
36.	Number of Degrees and Certificates Native Hawaiian	3	4	3	
37.	Number of Degrees and Certificates STEM	Not STEM	Not STEM	Not STEM	

Many ABIT graduates seek employment in small businesses in the hospitality or technology industry. Recent graduates from the ABIT program have received employment in the local high technology industry on Maui, specifically at the Pacific Disaster Center, based out of Kihei, Maui. Additional details about graduate highlights can be found at the UHMC ABIT website at <http://maui.hawaii.edu/abit>. ABIT graduates communicate on a regular basis over a dedicated LinkedIn group. Also, ABIT graduates make presentations to current ABIT students during online mixers and events during the fall and spring semester. This networking and comradery among the ABIT students and graduates provide encouragement and opportunities for graduates of the program. Finally, several ABIT students who are middle-level managers in the IT or high-tech sector are willing and able to assist current students in job search opportunities and mentoring.

### 3. Program Student Learning Outcomes for ABIT BAS

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a) List of the ABIT BAS Program Student Learning Outcomes

In addition to demonstrating college-wide learning outcomes in creativity, writing, critical thinking, oral communication, quantitative reasoning, and information literacy, graduates of the Bachelor of Applied Science (BAS) degree in Applied Business and Information Technology (ABIT) program, will be able to do the following:

1. Develop effective business plans and strategies using essential business functions such as marketing, management, accounting, and statistics.
2. Design prototypes using current business technology for e-commerce, web programming, databases, systems analysis, and project management.
3. Create minimum viable products or services for a feasible business venture through entrepreneurship and technology skills.
4. Demonstrate business ethics, value, and integrity through teamwork and leadership.

b) ABIT BAS Program Outcomes that have been assessed in the year of this Annual Review.

Mandatory **Capstone courses** that demonstrate the above PLOs at a graduation-ready level.

- Capstone I (BUS 495) – Lean Launchpad, Business Canvas and Minimum Viable Product
- Capstone II (BUS 496) – Extend MVP with Customer Feedback, Prepare for Launch

The major assessment activity that measures all the ABIT PLOs is the Capstone Project I or BUS 495. This project is assessed by the ABIT Advisory Board, community members and the ABIT faculty. The assessment activity for the ABIT Capstone project is as follows:

1. In Week 5 or so of Capstone I, students make pitch of the project to the Advisory Board
2. In Week 13 of Capstone I, students demonstrate their project to the community
3. Assessment Rubrics, that cover all PLOs, are used in Week 5 and Week 13
4. Students are also assessed on soft skills such as communication and presentation skills
5. Students receive ongoing feedback from instructor and mentoring from Advisory Board

c) Assessment Results – All four PLOs and CASLO for Information Literacy

In the Fall of 2021, the ABIT program conducted a program assessment report of all the ABIT program PLOs and the CASLO for Information Literacy. The Portfolio Model #3 was used to assess the results and the deliverables from the ABIT Capstone I or BUS 495 were used as artifacts. The ABIT advisory board reviewed the deliverables and provided feedback on the PLOs and CASLO on Information Literacy. Summary report of the feedback on the ABIT PLOs and CASLO is [here](#). Shared Google Folder containing all the artifacts from ABIT Capstone I is [here](#). The Appendix section contains a copy of the ABIT Program Assessment Report, which is also [here](#).

Overall, the ratings of the ABIT Advisory Board were favorable as regards their assessments of the PLOs and the CASLO on Information Literacy. In the feedback on the PLOs, the Advisory Board

provided a rating of 4 or above. As for the CASLO on Information Literacy, the reviews were also positive. This is not surprising given that the ABIT program focuses on Information Theory and Literacy from the very beginning. The comment below highlights the sentiment of the reviewers –

*On the whole, I believe the ABIT program and the capstone project provide a solid foundation, knowledge and skills for student to "launch" a business. (Or at least to be part of a team that is tasked with doing so or tasked to evaluate doing so.) I think some areas like forecasting revenues and operating costs are not as deeply assessed/applied, but others, like prototyping, user/client interviews, and general presentation are really good, creative*

d) Changes that have been made as a result of the assessment results.

As a result of the feedback, and discussions with the Advisory Board, the ABIT program has implemented changes in the ACC 300 (Intermediate Accounting Course) that provides a foundation for the financial revenues and forecasting in the BUS 495 Capstone project. The new Accounting Instructor will focus on preparing students for accounting and financial reports that are suitable for startups and small business operations. The ABIT program continues to monitor the feedback from the Advisory Board and will assess all PLOs and one CASLO every year for the BUS 495 course.

## 4. Action Plan

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The ABIT BAS program has long championed the online modality as the preferred means of education, thereby allowing students to access education from a distance. With the decline of the Covid pandemic in the summer of 2022, ABIT retains the online modality as the prime means of education. As a result of this approach, ABIT has attracted transfer students from all neighbor islands including Hawaii, Lanai, Molokai, and Kauai. While some of these students have general background that is not grounded in technology, other students are very qualified in technology having graduated from technical AS program in UH Community Colleges.

Highlights of the previous 2020-21 Action Plan –

1. Report on the fastest growing jobs of the next decade, including remote jobs
2. Compressed 8-week asynchronous online modality for upper division ABIT program
3. Curricular updates for all upper division ABIT courses in the Quali system
4. Agreements with four UHCCs for pathways from AS degree to the ABIT BAS
5. Applied Research in Cybersecurity, based on grants from NSF and NSA CAE designation

Key recommendations and commendations from the ABIT Advisory Board for 2021-22 include –

1. Continue the system design and thinking that is the foundation of ABIT capstone projects
2. Focus on data sciences and cybersecurity as the potential for job growth in the next decade
3. Evolve entrepreneurship activities outside the classroom with business plan competitions
4. Expand the advisory board outside Maui Island, as the students represent the entire state
5. Create Professional or Continuing Education programs to co-exist with credit courses

Based on the feedback from the Deans on the previous 2021-21 Action Plan, as well as ongoing discussions and feedback from the ABIT Advisory Board, here are five imperatives for ABIT. These imperatives will help re-envision the ABIT BAS program for the next decade of growth and align well with the four imperatives of the UH System and UHMC Strategic Plan for 2023-2029.

### **Imperative 1 - Focus on high growth, high paying emerging jobs for the next decade**

Based on the economic impact of the Covid-19 pandemic, the future economy of Hawaii may be more diversified and rely on technology jobs. The ABIT program is well positioned to train current students in jobs that will be prevalent in Hawaii in future. Many jobs on the mainland are also open to Hawaii residents due to the “remote first” policy of mainland employers. The ABIT program needs to target its curriculum and education towards these emerging high growth and high paying jobs. It can be assumed that Hawaii will be a high cost of living for the next decade or more, but there will be an increase in the prevalence of high-paying jobs from mainland and local firms.

These employment trends are highlighted in the jobs report below ([source](#)). ABIT will focus on a few key jobs listed below which involves data scientists, information security analysts and web programmers. These jobs are often available for remote workers and are often high paid positions.

## **FASTEST-GROWING JOBS FOR THE NEXT DECADE**

According to the Bureau of Labor Statistics, the coronavirus pandemic has increased the demand for STEM jobs and remote positions that depend on math and science skills. Here the top 10 fastest-growing jobs for the next decade.

Job	Projected Growth Rate	Median Pay
Statisticians	35.40%	\$92,270
Information security analysts	33.30%	\$103,590
Data scientists and mathematical science occupations	31.40%	\$98,230
Epidemiologists	29.60%	\$74,560
Operations research analysts	24.60%	\$86,200
Actuaries	24.50%	\$111,030
Software developers and software quality assurance analysts, testers	22.20%	\$110,140
Computer and information research scientists	21.90%	\$126,830
Medical scientists (except epidemiologists)	16.90%	\$91,510
Forensic science technicians	15.60%	\$60,590

## **Imperative II – Diversify the Hawaii economy with Professional and Continuing Education**

The economy of Hawaii, and Maui in particular, is overly reliant on the hospitality and tourism industry. The brand of Maui and Hawaii as a tourist destination is known throughout the world. While this draws in tourist dollars and revenues to the local governing bodies, this industry is not suitable for all residents, nor does it allow for many residents to afford a basic quality of living. In the unlikely, but recent incidence of a pandemic or other calamity that severely impacts the tourist industry, there are serious downturns in the local economy. For example, during the height of the Covid pandemic in the summer of 2020, the unemployment rate of Maui from a low of 3% to around 19% which was amongst the highest in the nation. To achieve this diversification, there needs to be a reskilling or retraining of key segments of the workforce, who are currently employed

in the local hospitality and tourism industry. These workers need education and training in the best modality and curriculum that is suitable for their specific situation and circumstances.

In addition to the existing credit courses that provide a pathway for students to obtain an ABIT BAS, the program needs to provide Professional and Continuing Education for working professionals. These “non-credit” programs provide Continuing Education Units (CEUs) and a Certificate of Completion upon completion. Students in these programs are combined with students in the existing credit programs, thereby allowing for synergies and networking possibilities.

The ABIT program can offer the following Professional Education Certificates that are tailored specifically to working professionals who want a compressed pathway to their desired career.

- a. **Certificate in Cybersecurity** – Four 8-week courses, Fall and Spring Semesters, 48 CEUs, courses target industry certifications in Network+, Security+ and Ethical Hacking. Based on existing courses in compressed format – ICS 169-184-171-281
- b. **Certificate in Data Science** – Three 8-week courses, Fall and Spring Semesters, 36 CEUs, courses targets fundamentals of data science with application to business decision making. Based on existing courses ICS 173-320-BUS 310
- c. **Certificate in Entrepreneurship** – Two 8-week courses in the Spring Semester, that culminates in a 16-week Fall Semester Capstone I course, 36 CEUs. Focus is on the basics of Entrepreneurship, based on existing courses – ICS 320-BUS 320, BUS 495

### **Imperative III – Showcase ABIT as a Center of Academic Excellence for Cybersecurity and Applied Research Hub**

**Center for Academic Excellence (CAE) in Cyber Defense Education (CDE)** - In April 2019, the ABIT BAS program was designated a CAE-CDE by the National Security Agency (NSA) and Department of Homeland Security (DHS). This designation was granted primarily due to the focus on cybersecurity education within several ABIT courses. Students who graduate from the ABIT program are entitled to receive a special CAE CDE certificate. This designation will help ABIT to attract students who are interested in pursuing a cyber career. This designation as a CAE also allows the ABIT program and UHMC to be eligible for funding from a variety of government sources. As noted earlier several ABIT students have received the CAE CDE certificate since May 2019.

**Applied Research Hub** - ABIT faculty and program coordinator, Dr. Debasis Bhattacharya, is the recipient of several NSF grants that total more than \$2M since 2012. Until September 2020, Dr. Bhattacharya was the Principal Investigator (PI) of two statewide NSF grants. Currently, Dr. Bhattacharya has been awarded a grant by the NSA GenCyber program to host summer workshops for HI DoE teachers in cybersecurity. This NSA GenCyber grant was awarded in 2022 and 2023.

Given the imperative of the UH Strategic Plan for 2023-29 to diversity the Hawaii economy through innovation and research, the ABIT BAS program can serve as a conduit for the application of fundamental research that is conceived at the business and engineering laboratories at UH Manoa. The ABIT BAS program can co-exist with the HITIDE incubator at the UH Office of Innovation and Commercialization and facilitate the application of new technology innovations at UHMC.



#### **Imperative IV – Expand the Reach of ABIT BAS throughout the State of Hawaii and the US Mainland**

**Agreements with UH CCs** - ABIT has completed a MoA with Hawaii CC where their AS in ITS graduates would be eligible to pursue upper division courses from Oahu and complete the BAS in ABIT degree. In addition to Hawaii CC, the ABIT program also completed MoAs with Kapiolani CC, Honolulu CC and Leeward CC. These MoAs allow the ABIT BAS program to be an option for graduates from all the large community colleges within the UHCC system. The publicity gained by these MoAs within the community colleges has contributed to the increased enrollment in ABIT.

**ABIT Advisory Board and Employer Network** – ABIT has traditionally relied on an Advisory Board that comprises local members of the community from Maui. With the expansion and growth of the ABIT program across the state, this Advisory Board needs to also expand in location and reach. It would make sense for ABIT Advisory Board members to reside on all key neighbor islands, as well as on the main island of Oahu. In addition, the Employer Network of ABIT graduates has expanded beyond the traditional confines of the Hospitality and Tourism industry on Maui. As a natural course of evolution, it would make sense for ABIT to engage with employers across the state of Hawaii, as well as key metropolitan areas in the UH Mainland.

#### **Imperative V – Differentiate ABIT BAS from other programs by Tech Entrepreneurship**

As online education proliferates, students have an increasing array of choices before them in terms of opportunities and possibilities. At the advent of the ABIT BAS program in 2007, the program provided an in-person education opportunity for residents of Maui Island. However, looking ahead in 2022, there are numerous online opportunities for residents of Maui Island. Conversely, the ABIT BAS program attracts students from all over the state of Hawaii and has the potential to enroll students from the US Mainland and international locations.

Due to this proliferation of choices, the ABIT BAS program needs to differentiate itself from other competing programs, especially from the UH Manoa Shidler School of Business. The ABIT BAS program will differentiate itself by providing students with a strong foundation in technology, statistics, entrepreneurship, and business, which will culminate in a technology focused Capstone course. This two-semester Capstone course will highlight the entrepreneurial skills that is needed to ideate, design, innovate and launch new businesses.

## 5. Resource Implications

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The ABIT BAS program would request an **annual operating budget of \$10,000** to sustain program activities and expenses. This budget would cover expenses for marketing activities, supplies, travel to neighbor islands and other program development activities.

The cost of the ABIT program is shown below and is largely based on the salaries of one FT faculty. Extramural grants from the NSA and NSF pay for lecturer fees for several ABIT lecturers every year. The ABIT program is profitable and makes significantly more revenues, primarily based on the SSH from upper division revenues, than the total cost to run the program. With cost per SSH holding steady at \$159, the ABIT program is profitable and sustainable over the next few years. The ABIT program intends to hire one FT faculty in the AY 23-24 to focus on business courses. This hire will decrease the reliance on lecturers but will keep the overall ABIT budget expenditure as is.

14.	Overall Program Expenditures	\$145,478	\$145,588	\$131,998
14a.	General Funded Budget Allocation	\$138,152	\$144,294	\$129,235
14b.	Special/Federal Budget Allocation	0	0	0
14c.	Tuition and Fees	\$7,326	\$1,294	\$2,763
15.	Cost per SSH	\$178	\$152	\$159

The following table highlights the changes in revenues, per SSH, from ABIT students.

4.	SSH Program Majors in Program Classes	447	501	471
5.	SSH Non-Majors in Program Classes	369	456	357
6.	SSH in All Program Classes	816	957	828

It should be noted that about 50% of ABIT students are upper division students who pay \$306 per credit hour. The remaining 50% of students are lower division students who pay \$131 per credit hour. Using these numbers, an estimate of the profit per SSH is derived below.

- Revenues for upper division SSH - 50% of 828 or 414 x \$306 = \$126,684
- Revenues for lower division SSH - 414 x \$131 = \$54,234 for total of \$180,918
- Cost per SSH is \$159, so cost for 828 SSH is \$131,652
- **Profit for all SSH is estimated to be at least \$49,266**

 **I am NOT requesting additional resources, apart from an annual operating budget of \$10K**

## APPENDIX

### PROGRAM ASSESSMENT REPORT University of Hawai'i Maui College

Program	Applied Business and Information Technology (ABIT) BAS
Semester	Fall 2021
Date	November 18, 2021
Participants/Title/Role	<ul style="list-style-type: none"> <li>• ABIT Capstone Students in BUS 495 or Capstone I course</li> <li>• Instructor of BUS 495 Course Debasis Bhattacharya</li> <li>• ABIT Advisory Board who reviewed deliverables from students</li> </ul>
Course(s)	BUS 495 - ABIT Capstone I
Artifacts	<p>The artifacts are included in the following shared Google Folder <a href="#">here</a></p> <ul style="list-style-type: none"> <li>• Survey about 4 PLOs and CASLO sent to ABIT Advisory Board</li> <li>• Google spreadsheet response sheet of Board survey</li> <li>• Detailed Assessment Survey Reports in PDF format</li> <li>• Shared folder also contains the following               <ul style="list-style-type: none"> <li>◦ Rubric used by Advisory Board to assess student Final Presentations at end of Capstone I</li> <li>◦ Final scores for each of three teams bases on rubric</li> <li>◦ Links to the final presentations by four project teams</li> </ul> </li> </ul>
<a href="#">Program assessment model</a>	<p><b>Portfolio Model #3</b></p> <ul style="list-style-type: none"> <li>• BUS 495 measures all four ABIT PLOs</li> <li>• CASLO selected was - <b>Information Literacy</b></li> <li>• Capstone final deliverable was the artifact or assignment that covered all four PLOs and Information Literacy CASLO</li> <li>• ABIT Advisory Board provided feedback on student deliverables</li> <li>• ABIT Advisory Board also feedback on PLOs and CASLO</li> </ul>
Brief description of assessment process	<p>The assessment process for ABIT Capstone I involves the following:</p> <ol style="list-style-type: none"> <li>1. Students complete a project that includes all 4 ABIT PLOs</li> <li>2. The Fall 2021 project also covered CASLO Information Literacy</li> <li>3. ABIT Advisory Board mentored and guided all three projects</li> <li>4. Students demonstrated their exit skills by doing the project</li> <li>5. ABIT Advisory Board and students were provided with rubric</li> <li>6. Using rubric, all Capstone project assessments were recorded</li> <li>7. ABIT Advisory Board filled out a survey on PLOs and CASLO</li> <li>8. Responses to the survey was collected and analyzed</li> </ol>

Evidence of assessment	<p>The evidence of the assessment included the following in GDrive <a href="#">here</a></p> <ul style="list-style-type: none"> <li>• Survey results from Advisory Board about PLOs and CASLO</li> <li>• Assessment feedback from Advisory Board on four projects</li> </ul>
Assessment Outcomes	<p>Overall, the ABIT Advisory Board had a favorable opinion and assessment of the four Capstone projects delivered in Fall 2021. Summary reports of the PLOs and CASLO assessments are <a href="#">here</a>.</p> <p>Based on the survey on ABIT PLOs and CASLOs, here is the summary feedback from three (3) members of the ABIT Advisory Board -</p> <ol style="list-style-type: none"> <li>1. PLO1 - 2 out of 3 members gave a rating of 4 or above</li> <li>2. PLO2 - 3 out of 3 members gave a rating of 4 or above</li> <li>3. PLO3 - 3 out of 3 members gave a rating of 4 or above</li> <li>4. PLO4 - 3 out of 3 members gave a rating of 4 or above</li> </ol> <p>In response to the CASLO for Information Literacy, responses included -</p> <ol style="list-style-type: none"> <li>1. Outcome 3.1 - 2 out of 3 members rated Sufficient Achievement or above</li> <li>2. Outcome 3.2 - 3 out of 3 members rated Sufficient or Exemplary</li> <li>3. Outcome 3.3 - 3 out of 3 members rated Sufficient or Exemplary</li> <li>4. Outcome 3.4 - 3 out of 3 members rated Sufficient or Exemplary</li> <li>5. Outcome 3.5 - 3 out of 3 members rated Sufficient or Exemplary or Higher</li> </ol> <p>Comments provided by one board members included the following -</p> <p><i>On the whole, I believe the ABIT program and the capstone project provide a solid foundation, knowledge and skills for student to "launch" a business. (Or at least to be part of a team that is tasked with doing so or tasked to evaluate doing so.) I think some areas like forecasting revenues and operating costs are not as deeply assessed/applied, but others, like prototyping, user/client interviews, and general presentation are really good, creative</i></p>