Notice of Meeting
UNIVERSITY OF HAWAI'I
BOARD OF REGENTS COMMITTEE ON ACADEMIC AND STUDENT AFFAIRS

Members: Regents Wilson (Chair), Westerman (Vice-Chair), Nahale-a, Sullivan, and Tagorda

Date: Thursday May 21, 2020

Time: 8:30 a.m.

Place: Virtual Meeting

In light of the evolving COVID-19 situation, protecting the health and welfare of the community is of utmost concern. As such, this will be a virtual meeting and written testimony and oral testimony will be accepted in lieu of in-person testimony. Meetings may be monitored remotely via the livestream pilot project. See the Board of Regents website for information on accessing the livestream: www.hawaii.edu/bor. Mahalo for your consideration.

AGENDA

I. **Call Meeting to Order**

II. **Approval of Minutes of the February 6, 2020 Meeting**

III. **Public Comment Period for Agenda Items**
All written testimony on agenda items received after posting of this agenda and up to 24 hours in advance of the meeting will be distributed to the board. Late testimony on agenda items will be distributed to the board within 24 hours of receipt. Written testimony may be submitted via the board's website, US mail, email at bor.testimony@hawaii.edu, or facsimile at 956-5156. All written testimony submitted are public documents. Therefore, any testimony that is submitted for use in the public meeting process is public information and will be posted on the board's website.
Those wishing to provide oral testimony for the virtual meeting may register here. Given constraints with the online format of our meetings, individuals wishing to orally testify must register no later than 8:00 a.m. on the day of the meeting in order to be accommodated. It is highly recommended that written testimony be submitted in addition to registering to provide oral testimony. Oral testimony will be limited to three (3) minutes per testifier.

IV. **Agenda Items**

A. Review and Recommend Board Approval to Change from Provisional to Established Status: Bachelor of Arts Degree in Public Health, University of Hawai'i at Mānoa

B. Review and Recommend Board Approval to Change from Provisional to Established Status: Bachelor of Arts in Pharmacy Studies, University of Hawai'i at Hilo

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For disability accommodations, contact the Board Office at 956-8213 or bor@hawaii.edu. Advance notice requested five (5) days in advance of the meeting.

C. Review and Recommend Board Approval to Change from Provisional to Established Status: Marine Biology Graduate Program for Doctoral and Master of Science Degrees in Marine Biology, University of Hawaiʻi at Mānoa

D. Review and Recommend Board Approval for the Establishment of a Provisional Bachelor of Science in Cybersecurity, University of Hawaiʻi – West Oahu

E. Committee Annual Review

F. University of Hawaiʻi Student Caucus Spring 2020 Update (For Information Only)

V. Adjournment

For disability accommodations, contact the Board Office at 956-8213 or bor@hawaii.edu.
Advance notice requested five (5) days in advance of the meeting.

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DISCLAIMER – THE FOLLOWING ARE DRAFT MINUTES AND ARE SUBJECT TO FURTHER REVIEW AND CHANGE UPON APPROVAL BY THE COMMITTEE

MINUTES

BOARD OF REGENTS COMMITTEE ON ACADEMIC AND STUDENT AFFAIRS MEETING

FEBRUARY 6, 2020

I.   CALL TO ORDER

Chair Ernest Wilson called the meeting to order at 12:48 p.m. on Thursday, February 6, 2020, at the University of Hawaiʻi at Mānoa, Information Technology Building, 1st Floor Conference Room 105A/B, 2520 Correa Road, Honolulu, Hawaiʻi 96822.

Committee members in attendance: Chair Ernest Wilson Jr.; Regent Jan Sullivan; and Regent Michelle Tagorda.

Committee members excused: Vice-Chair Robert Westerman; Regent Alapaki Nahale-a.

Others in attendance: Board Chair Ben Kudo; Regent Simeon Acoba; Regent Eugene Bal; Regent Wayne Higaki; Regent Michael McEnerney; Regent Randy Moore (ex officio committee members); President David Lassner; Vice President (VP) for Community Colleges Erika Lacro; VP for Legal Affairs/University General Counsel Carrie Okinaga; VP for Academic Planning and Policy Donald Straney; UH-Mānoa (UHM) Provost Michael Bruno; UH-Hilo Chancellor Bonnie Irwin; UH-West Oʻahu Chancellor Maenette Benham; Kapiʻolani Community College (KapCC) Chancellor Louise Pagotto; Leeward Community College (LeeCC) Chancellor Carlos Peñaloza; Executive Administrator and Secretary of the Board of Regents (Board Secretary) Kendra Oishi; and others as noted.

II.   APPROVAL OF MINUTES OF THE NOVEMBER 7, 2019 MEETING

Regent Sullivan moved to approve the minutes of the November 7, 2019 meeting, seconded by Regent Tagorda, and noting the excused absence of Vice-Chair Westerman and Regent Nahale-a, the motion carried, with all members present voting in the affirmative.

III.   PUBLIC COMMENT PERIOD

Board Secretary Oishi announced that the Board Office received no written testimony and no individuals had signed up to provide oral testimony.

IV.   AGENDA ITEMS

VP Lacro provided an overview of the accrediting agency follow-up report for KapCC and LeeCC. She noted that both KapCC and LeeCC submitted a comprehensive Institutional Self Evaluation Report in August 2018 and that both campuses were visited

by a peer review team in October of that same year. She reported that in January 2019, KapCC received accreditation for 18 months while LeeCC received accreditation for seven years. However, both KapCC and LeeCC were required to submit follow-up reports no later than March 2, 2020, to address recommendations made by the peer review team. After the follow-up report is filed, another peer review team will conduct additional site visits of both campuses which is anticipated to take place in October of this year.

A. <u>**Kapiʻolani Community College Accreditation Follow-up Report to the Accrediting Commission for Community and Junior Colleges (ACCJC)**</u>

VP Lacro introduced KapCC Chancellor Louise Pagotto who highlighted that KapCC received four commendations from the ACCJC for practices for which the Commission believed the institution exceeded standards. However, she also noted that the ACCJC determined that KapCC must demonstrate compliance with certain Commission standards as identified in two recommendations made by the peer review team. The ACCJC recommended that KapCC regularly evaluate its institutional plans and governance and decision-making policies, procedures, and processes to ensure their effectiveness and that these evaluations be widely communicated across the institution. The ACCJC also recommended that KapCC analyze and document the results of learning outcomes assessment across all disciplines and programs and integrate this analysis and documentation into program review and institutional planning processes on a regular and consistent cycle. Chancellor Pagotto noted that steps taken by KapCC to address these issues and recommendations are stated in the follow-up report which has been provided to the committee and will be submitted to the ACCJC as required.

B. <u>**Leeward Community College Accreditation Follow-up Report to the ACCJC**</u>

VP Lacro introduced LeeCC Chancellor Carlos Peñaloza who highlighted that LeeCC received six commendations from the ACCJC for exemplary performance. However, he noted that ACCJC determined that LeeCC must demonstrate compliance with certain Commission standards as identified in one recommendation made by the peer review team. The ACCJC recommended that LeeCC establish a clear cycle to regularly evaluate and update its policies and procedures. Chancellor Peñaloza noted that steps taken by LeeCC to address this issue and recommendation are stated in the follow-up report which has been provided to the committee and will be submitted to the ACCJC as required.

Chair Kudo noted that the student conduct code was replaced by a system-wide conduct code and asked what the major changes were to the conduct code. VP Lacro responded that she did not recall the specific changes but could provide them to the committee. She remarked that the conduct code required updating as the previous conduct code was quite old and was last updated in the 1980s.

Regent Higaki left at 12:58 p.m.

Regent Acoba questioned whether Chancellor Peñaloza thought the evaluation and recommendation by the ACCJC was a fair assessment. Chancellor Peñaloza replied

that the evaluations are very subjective and noted that LeeCC was already in the process of reviewing the issue which the peer review team felt needed to be addressed. VP Lacro added that depending on the individuals on any given ACCJC peer review team, the evaluation of, and recommendation on, the same issue can vary tremendously.

Chair Wilson inquired as to whether the administration reviews all the findings and recommendations received from the various accrediting commissions for the each campus of the UH System to determine if actions may need to be taken on a system-wide level. President Lassner responded that the six community colleges are evaluated simultaneously by one accrediting agency which allows the VP for Community Colleges to collectively review all the evaluation reports and recommendations and would provide community colleges with the opportunity to determine if issues need to be addressed on a broader scale. However, the other campuses of the system are all evaluated at different times which would make a broad scale application of recommendations more difficult. He also noted that every peer review team is different and, depending on who is on the review team, the outcomes of evaluations can run the gamut. As such, the recommendations for any particular campus might not be particularly valuable to another campus. However, the evaluations and recommendations are seen by all campus administrations, which permits campuses to share their issues, and allows the system to work together to continuously improve.

C. **Draft Academic Program Master Plan (Draft Master Plan)**

Prior to the presentation on the Draft Master Plan, Chair Wilson noted that Regent Tagorda disclosed that she is a faculty specialist with the Office of Public Health within the School of Social Work at UHM. Given the fact that the presentation to the committee is based on a Draft Master Plan, that any discussions by the committee on the Draft Master Plan will be very broad and taking place at a high level, that no decision will be made by the committee on the Draft Master Plan for the UH System as a whole, and that the Draft Master Plan is a high-level planning document, Board Chair Kudo and Chair Wilson have concurred that Regent Tagorda's participation in these discussions is appropriate. Chair Wilson asked if there were any concerns among committee members with allowing Regent Tagorda to participate in these discussions. There being no concerns expressed, Chair Wilson called upon VP Straney to begin his presentation.

VP Straney provided background information on the Draft Master Plan and presented a brief overview of the current status of the Draft Master Plan's development stating that it identifies academic programs already provided by the ten campuses of the UH System, as well as academic programs that will need to be provided to address both the current and long-term educational needs and challenges of the state. The Draft Master Plan is a key component of the Integrated Academic and Facilities Plan - a plan which identifies goals and guiding principles for managing academic programs across the UH System to avoid unnecessary duplication and offer programming that is best suited for each campus. He noted that the Draft Master Plan adopted a multi-year perspective in order to better align academics with planning for enrollment, facilities planning, and fiscal planning. The Draft Master Plan is also designed to use medium-

and long-range approaches to the provision of education so that academic offerings can be proactively aligned to meet both existing and emerging educational needs while remaining fluid and retaining the ability to adapt programs to meet ever-changing educational and workforce situations.

VP Straney discussed the process used in developing the Draft Master Plan, including guidelines and criteria used and program priorities that were considered. He remarked that, while academic program development occurs mainly at the campus and unit level, having a master academic plan will ensure that campus and unit plans are shared system-wide which will allow for better allocation and use of oftentimes limited resources. He noted that the Draft Master Plan is a dynamic document that is intended to be updated regularly and stated that the administration is currently working on revising various Executive and Regent Policies to allow for proper implementation of the Draft Master Plan.

Regent Tagorda asked whether the Draft Master Plan could show academic programs under consideration for review in addition to new academic programs being initiated. VP Straney replied that it was important to see the programs that were being discontinued as well as what was being initiated or being proposed and that some of the items from academic action reports were incorporated into the Draft Master Plan to allow for this to occur.

Board Chair Kudo asked whether information regarding the various programmatic and academic needs was gathered by collecting it on an individual basis prior to the development of the matrix contained in the Draft Master Plan. VP Straney responded in the affirmative.

Board Chair Kudo questioned whether there was a process the administration, or perhaps other universities, used to look at farther reaching educational and programmatic needs that will be faced in the future, longer than the six-year timeframe envisioned by the Draft Master Plan, perhaps even decades in the future. VP Straney replied that the Third Decade Project does this with a ten-year perspective. He noted that there is value in having a much longer timeframe perspective to better prepare for the educational needs of the future. VP Straney remarked that there are individuals across the country looking at what post-secondary education will look like in the future, including how universities will work and the role they'll play in meeting future workforce and educational needs, and mentioned several books that have recently been published on the subject. He also noted that UH was fortunate in that the Futures Institute in the Department of Political Science is currently performing this type of work.

Regent Sullivan expressed her concerns that, while the Draft Master Plan was a good endeavor, it may create increased bureaucracy that does not make for good adaptation to change. She commented that perhaps the administration could look at an alternative process that could be built in to the Draft Master Plan to allow for experimentation with new curricula and programs by faculty which could serve as an incubator that would provide for fast success or failure and encourage new thinking and quicker adaptation. President Lassner mentioned that UH currently has different ways of establishing innovative curricula on each campus and that innovative and

experimental courses are fairly easy to offer. He provided several examples of incubator-type programs currently in existence that have become, or have the potential of becoming, full-fledged degree programs.

Regent Sullivan noted that the Draft Master Plan did not appear to address costs that invariably occur whenever new programs are created. VP Straney noted that at the end of each unit section of the Draft Master Plan there is a short portion that discusses fiscal implications, enrollment implications, facility implications, and so on which is a starting point to address this issue.

Regent Sullivan discussed the concept of incorporating a systemwide overview within the Draft Master Plan that looks at areas of study by program and campus to gain a better understanding of what is available at each campus and to avoid duplication and allow for more efficient use of resources. VP Straney mentioned that this is being done to some extent by smaller groups but that this is something that will need to be addressed on a larger scale to be more effective and the administration can work on addressing this issue.

Noting that, of all the rolling plans being developed by the administration, the Draft Master Plan has the most interface and interaction with the community, Regent Moore asked how the administration was obtaining input from the various sectors of the community that may be interested in or affected by various aspects of the Draft Master Plan. VP Straney replied that academic planning cannot occur in isolation and that the vision of the Draft Master Plan is to take into account the numerous issues and groups that may have an impact, or be impacted by, the development of an academic program. President Lassner added that there have been workshops held that worked with various sectors of the business community to understand their workforce development needs which is one way of creating increased involvement in the academic planning process.

Regent Wilson stated that when looking at the labor market and statistics there are areas of the labor market that have critical needs such as in the healthcare industry and asked whether UH was focusing on these needs and the ability to meet future workforce demands. VP Straney responded in the affirmative stating that this is why it is imperative to have proper academic planning that involves all stakeholders.

Regent Moore inquired as to where, in the process of academic planning, does the teaching of soft skills come in. VP Straney replied that this generally occurs through the use of articulated learning outcomes but the question of whether these outcomes are being achieved or not has not yet been asked and is something that the administration will be working on.

Brief discussions occurred on how the administration was planning on addressing the need to develop basic, cognitive skills that are used across academic curricula in an academic planning process that appears to be focused on the concept of planning creative career or educational pathways with an emphasis on specific skills.

Chair Wilson recommended, and the committee agreed, that the Draft Master Plan should be presented to the full board to allow for further comment and discussion. VP

Straney suggested that it be presented to the full board once development of the Draft Master Plan is further along in the process. President Lassner added that this is a first attempt in developing a draft, multi-year academic plan and that the administration hopes to continue to present it to the board to receive suggestions and feedback on how it can be continually improved.

V.   ADJOURNMENT

There being no further business, Regent Sullivan moved to adjourn, Regent Tagorda seconded the motion, and noting the excused absences of Vice-Chair Westerman, Regent Acopan, and Regent Nahale-a, and with all members present voting in the affirmative, the meeting was adjourned at 1:47 p.m.

Respectfully Submitted,

Kendra Oishi
Executive Administrator and Secretary
    of the Board of Regents

UNIVERSITY
of HAWAI'I·
MĀNOA

UNIVERSITY OF HAWAII
BOARD OF REGENTS

20 MAY -1 P2:32   RECEIVED

March 12, 2020

'20 MAY -1 P2:02

MEMORANDUM

UNIVERSITY OF HAWAII
PRESIDENT'S OFFICE

TO: Benjamin Asa Kudo
           Chair, Board of Regents

VIA: David Lassner
           President

VIA: Don Straney
           Vice President for Academic Planning and Policy

VIA: Michael Bruno
           Provost

VIA: Laura Lyons
           Interim Associate Vice Chancellor for Academic Affairs

FROM: Noreen Mokuau, Dean
           Office of Public Health Studies
           Myron B. Thompson School of Social Work

SUBJECT: REQUEST FOR ESTABLISHED STATUS FOR THE BACHELOR OF ARTS DEGREE IN
           PUBLIC HEALTH (BA PH) AT THE UNIVERSITY OF HAWAI'I AT MĀNOA

SPECIFIC ACTION REQUESTED:
It is respectfully requested that the Board of Regents grant established status to the Bachelor of Arts degree in Public Health (BA PH) in the Office of Public Health Studies at the Myron B. Thompson School of Social Work at the University of Hawai'i at Mānoa.

RECOMMENDED EFFECTIVE DATE:
Effective upon Board approval.

ADDITIONAL COST:
There are no additional costs associated with this request.

2430 Campus Road · Gartley Hall · Honolulu, Hawai'i 96822
Telephone: (808) 956-6300 · Fax: (808) 956-5964
An Equal Opportunity/Affirmative Action Institution

PURPOSE:

The Bachelor of Arts degree in Public Health (BA PH) is designed to educate undergraduates interested in public health and/or health profession training in the broad basic concepts of population-level health education, practice, and research, and promote an educated citizenry. The primary focus of public health education is to improve health and quality of life through population-based prevention and treatment of disease and other physical and mental health conditions, through surveillance of health outcomes and the promotion of healthy behaviors.

The BA PH program intends to prepare students for future careers in a wide array of career fields within public health. The Association of Schools and Programs of Public Health (ASPPH) has identified over 25 areas of specialization for students seeking a career in public health including injury prevention, HIV/AIDS, health policy and planning, tobacco control, health economics, reproductive health, food safety, program evaluation, minority health, geriatrics, health statistics, and more. These job categories are growing, locally, nationally, and internally.

Potential career paths in public health are wide-ranging, including epidemiology, biostatistics, public health administration, health policy planning and development, social and behavioral aspects of health, and environmental health. In some cases, public health professionals additionally specialize in other health professions, such as medicine, nursing, pharmacy, dentistry, or social work. Public health workers possessing a bachelor's degree in public health can expect to be prepared directly for entry-level public health positions that are meaningful, professional jobs.

BACKGROUND:

According to the U.S. Department of Labor, the health sciences field represents the largest single industry in the U.S., accounting for 14.3 million jobs across 200 different fields. In addition, seven of the 20 fastest growing occupations are health-related, generating 3.25 million new jobs between 2008 and 2018, a 22 percent increase, or double the growth of all other industries combined. In the future, it is anticipated there will be a growing need for health promotion professionals as a result of rising incidence of chronic disease, rising health care costs driving intervention strategies, increased need for research in the area of disease prevention, the aging work force, technological advances, and increased demand for consultants.

The public health workforce in the U.S. is shrinking, with 23% of the current workforce (almost 110,000 workers) eligible for retirement by 2012. Nationally, existing schools of public health would have to train nearly three times the number of current graduates to meet this projected demand. Our program has grown notably since its inception with 66 students in Spring 2014 and 165 students in Fall 2019. We expect this program to continue to grow over time. With topic experiences, including the novel corona virus (COVID-19), we anticipate meeting community needs and contributing to market growth.

ACTION RECOMMENDED:

It is respectfully recommended that the Board of Regents grant established status to the Bachelor of Arts degree in Public Health in the Office of Public Health Studies at the Myron B. Thompson School of Social Work at the University of Hawaiʻi at Mānoa.

Attachment: Provisional Review for the Bachelor of Arts (BA) degree in Public Health

cc: Executive Administrator and Secretary of the Board Kendra Oishi

Review of Provisional Academic Program to Established Status

Bachelor of Arts (BA) degree in Public Health

Office of Public Health Studies
Myron B. Thompson School of Social Work
University of Hawai'i at Mānoa

March 2020

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Program Overview

We are happy to share that the Bachelor of Arts degree in Public Health (BA PH) in the Office of Public Health Studies (OPHS) in the Myron B. Thompson School of Social Work, initially approved by the University of Hawai'i Board of Regents in September 2014, has completed its tenure as a provisional program and is meeting its planned objectives. We are successfully training University of Hawai'i at Mānoa undergraduate students towards population-level health education, practice, and research that build opportunities for careers in the critically important area of public health, and promote an educated citizenry. The program is fully accredited by the Council on Education for Public Health (CEPH) and shows clear evidence of growth, momentum, relevance, and sustainability, which is highlighted in more detail in this report.

The BA PH program is a vital component of the OPHS degree programs, which include graduate degrees for which the BA PH program has been a fruitful pipeline. The program has adequate resources to support it over time. We have detailed the program related to its target goals below. Evidence of program success include consistent and increasing student enrollment in our courses, publication of undergraduate student work in academic journals, gainful employment of our BA PH graduates, and peer-reviewed publications by faculty highlighting innovative educational practices and demonstrated effectiveness of BA PH courses. We also include several appendices with additional information.

Service to our university, local, and Pacific community is also a major value of OPHS. The BA PH program contributes graduates to address community workforce needs, provides service to community organizations through required student field experiences, and contributes to the professional field of public health through undergraduate research products. BA PH faculty also serve as a resource to other health-related undergraduate programs across the University of Hawai'i system, including the University of Hawai'i at Hilo (Health Promotions program), University of Hawai'i at West O'ahu (Community Health program), Maui College, and most recently Kaua'i Community College.

In the report that follows we provide evidence to demonstrate success of the BA PH degree as a provisional program, and as a valuable component of the University of Hawai'i and, in doing so, respectfully petition for approval as an established program.

1. Is the program organized to meet its objectives?

Program Objectives
The Bachelor of Arts degree in Public Health (BA PH) is designed to educate undergraduates interested in public health and/or health profession training in the broad basic concepts of population-level health education, practice, and research, and promote an educated citizenry. The primary focus of public health education is to improve health and quality of life through the

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population-based prevention and treatment of disease and other physical and mental health conditions, through surveillance of health outcomes and the promotion of healthy behaviors.

The BA PH program intends to prepare students for future careers in a wide array of career fields within public health. The Association of Schools and Programs of Public Health (ASPPH) has identified over 25 areas of specialization for students seeking a career in public health including injury prevention, HIV/AIDS, health policy and planning, tobacco control, health economics, reproductive health, food safety, program evaluation, minority health, geriatrics, health statistics, and more. These job categories are growing, locally, nationally, and internally.

Potential career paths in public health are wide-ranging, including epidemiology, biostatistics, public health administration, health policy planning and development, social and behavioral aspects of health, and environmental health. In some cases, public health professionals additionally specialize in other health professions, such as medicine, nursing, pharmacy, dentistry, or social work. Public health workers possessing a bachelor's degree in public health can expect to be prepared directly for entry-level public health positions that are meaningful, professional jobs.

Thus, the UH BA PH serves local, national, and global workforce and training needs in critical areas of health. It prepares students for graduate degree programs. More specialized and management level positions in public health typically require a master's degree or higher. A background from the UH BA PH can also provide a valuable background in population health for medical school, nursing school, and other graduate/professional degrees in the clinical health professions and beyond. Public health education at the baccalaureate level is becoming the common academic thread for entry level into public health across the United States. In addition to meeting the national call for education in public health, the UH BA PH also addresses current and anticipated public health workforce shortages within local communities and abroad.

Council on Education for Public Health Bachelor's Degree Curriculum Requirements

As a Bachelor's degree accredited by the Council on Education for Public Health (CEPH) by 2013 (the first year CEPH offered accreditation of bachelor degrees), the BA PH program has consistently demonstrated the ability to meet, and excel, on all set criteria. This includes the fact that CEPH accreditation criteria has evolved as undergraduate public health education has developed and expanded worldwide since the early 2010's. Our program has consistently demonstrated compliance with all CEPH criteria.

Bachelor of Arts in Public Health Program Curriculum

Our program meets all programmatic and accreditation goals through the following course requirements.

Program Requirements: Bachelor of Arts in Public Health Degree

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43 major credits (46 credits with related degree requirements) are required to graduate with a Bachelor of Arts degree in Public Health.

Public Health Related Courses (3 credits)
      PSY100 – Survey of Psychology (3 cr) (DS)

Public Health Major Core Courses (31 credits)
      PH201 – Intro to Public Health (3 cr) (DS)
      PH202 – Public Health Issues in Hawai'i (3 cr)
      PH203 – Introduction to Global Health (3 cr)
      PH210 – Quantitative Reasoning for Public Health (3 cr) (FQ)
      PH310 – Introduction to Epidemiology (3 cr)
      PH341 – Public Health Biology and Pathophysiology (3 cr) (DB)
      PH420 – Social Behavioral Health I: Health Promotions for Individuals and Groups (3 cr)
      PH480 – Application of Public Health Principles in Research and Practice (4 cr) (WI)
      PH485 – Public Health Applied Learning Experience (3 cr)
      PH489 – Public Health Undergraduate Capstone Seminar (3 cr) (WI)

Public Health Elective Courses (12 credits)
      PH301 – Seminar in Public Health Issues (3 cr)
      PH305 – Native Hawaiian and Indigenous Health (3 cr)
      PH325 – Youth Risk and Protection - Public Health Research, Practice & Policy (3 cr)
      PH330 – The United States Health Care System (3 cr)
      PH340 – Public Health and the Environment (3 cr)
      PH350 – Introduction to Biostatistics (3 cr)
      PH410 – Advanced Epidemiology (3 cr) (WI)
      PH411 – Nutrition and Disease Prevention (3 cr)
      PH420 – Social Behavioral Health I: Health Promotion for Individuals and Groups (3 cr)
      PH422 – Social Behavioral Health II: Health Promotion in Communities (3 cr)
      PH430 – Health Policy and Management (3 cr)
      PH435 – Aging in Today's Society (3 cr) (WI)
      PH445 – Introduction to Environmental Microbiology (3 cr)
      PH460 – Social Determinants of Indigenous People's Health (3 cr)
      PH492 (Alpha) – Current Issues & Topics in PH (variable credit)
      PH499 – Directed Reading (variable credit)

Since public health is by nature interdisciplinary, students are encouraged to take electives in areas outside of the department. Students can refer to the list of recommended electives offered in other departments for students in Public Health to consider in completing their 12 credits of advisor-approved upper division public health electives.

Admission Requirements
Incoming students. Students applying to the University of Hawai'i at Mānoa (UHM) as a freshman or transfer student may declare the Bachelor of Arts degree in Public Health as their

major upon entry. To stay in this major, they must complete PH 201 Introduction to Public Health with a B- or better.

Current students. All current UHM students requesting to change their major to the BA PH from other departments must first complete PH 201 Introduction to Public Health with a B- or better before declaring Public Health as their major. Students must fill out the major declaration form and meet with an academic advisor.

Concurrent degree students. Students may choose to pursue a concurrent degree in any UHM college/school in addition to a BA PH degree. The consideration of an additional field of study can increase knowledge, diversify perspectives, and enhance personal education as well as professional growth. Requirements for admission into the BA PH program as a concurrent degree includes completion of PH 201 Introduction to Public Health with a B- or better, a cumulative GPA of 3.25 or better, approval from the current advisor, and a statement of purpose from the applicant. Students must complete the concurrent degree declaration form.

Program Requirements: UHM General Education & College/School Requirements
We follow all UH requirements. To graduate from UH Mānoa, a student must satisfy (a) UHM General Education requirements, (b) requirements of the student's college or school, and (c) requirements of the student's specific academic major.
Credits:
- Students must earn a minimum of 120 total applicable credits, of which
- 45 credits must be upper division (300-level and above); and
- 30 credits must be completed in residence at UH Mānoa

GPA:
- Cumulative GPA of 2.5 (C average) or higher for all UH Mānoa registered credits in order to graduate; and
- GPA of 2.0 (C average) for all courses applied to the major requirements
- Grades of C (not C-) or higher in any required public health degree course completed at UH Mānoa

Graduation:
- Completion of a Graduation Worksheet to the Student Academic Services Office at least two semesters preceding the award of the degree;
- Completion of an application for graduation to the Student Academic Services Office in the semester preceding the award of the degree; and
- Completion of an exit survey

Undergraduate Culminating Experience
One of the key components of the BA PH is the Applied Learning Experience (APLE) series. The culminating experience in the BA program provides students the opportunity to actively apply classroom knowledge and associated skills to real-world application in the public health field. This is facilitated by a three-course series required for graduation within the BA PH degree: PH 480 Application of Public Health Principles in Research and Practice, PH 485 Applied Learning

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Experience, and PH 489 Public Health Undergraduate Capstone Seminar. OPHS faculty, as well as other mentors appropriate to the individual student project across the state and, depending on student needs and interests, in national and even international settings, guide the capstone experience. OPHS faculty are also the primary instructors of the PH 480, 485, and 489 courses and advise students throughout project development. Additional OPHS faculty members, other University of Hawai'i at Mānoa faculty, or approved community experts are encouraged to serve as advisors and mentors to specific Applied Learning Experience projects, as appropriate to the student selected topics.

APLE projects have resulted in 6 articles in publication or under review, as well as awards and presentations at conference. Some examples of successful projects include:
- Association of Health Literacy with Cardiovascular Disease in Chinese Americans (published in the *Hawai'i Journal of Medicine and Public Health*)
- "What I Chose" (Fictional novella on youth suicide prevention, written by a BA PH student using safe messaging guidelines; professionally published- CreateSpace Independent Publishing Platform)
- Elevated Levels of Circulating γ-Tocopherol as a Surrogate Marker of Mortality Risk in Populations of Adult Men Stratified by Health Index Score (Published in the *The FASEB Journal*)
- Key Factors in Obstetric Delivery Decision-Making among Asian and Pacific Islander Women by English Proficiency (published in the *Hawai'i Journal of Medicine and Public Health*)
- Expanding Services for Children with Congenital Zika Syndrome in American Samoa (Conducted in collaboration with the American Samoa Department of Health)
- The Effects of Climate Change and Poor Solid Waste Management on Water Security in Kivalina, Alaska (Conducted in collaboration with the Alaska Native Tribal Health Consortium-National Tribal Water Center)

Students present their literature review/ capstone project proposals and their final, completed work during a student showcase, the Office of Public Health Studies' Undergraduate Summit, each spring and fall. This is a major event for the department, receiving visitors from faculty in OPHS and other units, mentors, and other community partners. The students each create a poster, practice their presentation, and share their work for an hour in a public forum. This is extremely well received by faculty, alumni, and community members.

Program Revisions
Adjustments to the program have been made from what was originally approved by the Board of Regents based on demonstrated student needs and for improved alignment with national degree standards. These have all been submitted and approved by both the OVCAA's office and CEPH.

Many of our students struggle with mastery of quantitative skills, however, these are critical for successful public health professionals and educated citizens. Applied quantitative skills are

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especially important in preparation for our required epidemiology course work. To better prepare students for quantitative skills within a public health context, we developed, and implemented our own quantitative reasoning course. PH 210 (Quantitative Reasoning for Public Health) includes student development of applied skills in logical reasoning, quantitative reasoning, and statistics. This course is offered in an asynchronous online format to address UHM initiatives promoting the development of online coursework. We also applied for, and received, a UHM core general education designation in Symbolic Reasoning (FQ). With the development and implementation of PH 210 as a BA PH degree requirement in Spring 2018, our original statistics course and MATH 140 (Pre-calculus) degree requirements were identified as redundant in our curriculum, and removed.

As the number of undergraduate degrees across the nation expanded, national standards and recommendations continued to evolve. Through our published academic scholarship and supportive relationships with peer institutions, our program helped inform this evolution, but also responded to changes in recommendations. One identified gap in our curriculum included a course specifically dedicated to health education and the application of social and behavioral theories to behavioral changes. While our program did offer an elective course in social and behavioral health (PH 420), this course was not a degree requirement. In response to national recommendations, and with expanded instructional capacity provided by an incoming faculty member, our existing course was added to our curriculum as a BA PH requirement in Spring 2018.

Further development and support of written communication skills is a current, and growing, need among our BA PH students. It is also a nationally identified priority among employers of bachelor degree graduates. Many students enter our program with limited confidence in their own writing skills and poor preparation for college-level writing. To address this challenge, we developed, and are currently pilot testing, a 1-credit writing workshop to be added to our required pre-capstone course (PH 480). A proposal for modification of the PH 480 course to change the credit count from 3-credits to 4-credits, (accounting for the newly required writing workshop), has been approved by the OPHS faculty in Fall 2019 and has recently been approved by the OVCAA's office. The 4-credit PH 480 course will be required for BA PH students effective this Fall 2020.

Academic Advising
The Office of Public Health Studies provides advising and academic resources for undergraduate students including prospective, current, and students who recently graduated from the program. The advisor serves as a valuable resource who helps students navigate through their academic journey by working with students to clarify life and career goals, create academic and educational plans, learn decision-making skills, and solve problems affecting their education.

Advising Student Learning Outcomes (SLO's)
We have thoughtfully considered our student learning outcomes relative to our goals for students across each semester to document their expected growth and competencies. The BA PH Academic Advising SLOs statements articulate what students are expected to know, do, and

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value. The BA PH academic advising process specifically allows and expects students to experience cognitive, behavioral and affective learning and growth.

SLO 1: Students will be able to navigate STAR to track their academic progress and formulate an educational plan that will assist them in achieving their goals.

SLO 2: Students will be able to identify College and University resources and policies that enhance their educational experience.

SLO 3: Student will be able to identify their interests, strengths, values, and formulate an academic pathway that aligns these with their career goals.

SLO 4: Student will be able to prepare for capstone applied learning experience, graduation, and if applicable graduate school opportunities.

In lieu of a paper student handbook, to follow student preferences, undergraduate student resources are available on our website (http://manoa. hawaii.edu/publichealth). Information regarding our program, including BA degree requirements, a list of approved non-Public Health elective courses, the capstone experience, and academic advising is available at http://manoa.hawaii.edu/publichealth/degrees/undergraduate/sample.

Future Plans of Program Growth and Development

The role of the academic advising is vital to not only advise students but also to increase student support, recruitment efforts, to link more specifically with the MPH program, and provide new scholarship and publish in this domain. In the future, we intend to petition for a permanent, tenure-track faculty line in efforts to sustain the current specialist-level advisor role as our program continues to expand. We are also considering more online course offerings for the basic courses, including our introduction to public health course (PH 201). We also intend to strengthen training in basic written and oral communication skills of our students, based on assessed student need. We have been collaborating with Kaua'i Department of Health and Kaua'i College to provide basic public health courses to meet their needs. We also received a multi-unit award to support undergraduate learning and experiences in OneHealth, which is at the nexus of human, animal, and environmental health. We are offering a summer undergraduate elective course on this subject.

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2. Are program resources adequate?

The program resources are adequate to support the program. Early in development of the BA PH program, faculty were shared among the bachelors, masters, and doctoral degree programs. Today, the BA PH program has three dedicated tenure-track faculty members. They are all new hires at the Assistant Professor level. The specialist advisor is also a faculty member who works closely with the undergraduate program. One of these faculty members additionally serves an administrative role as the degree program chair. These dedicated undergraduate faculty members are the primary instructors responsible for eight of ten of our required major core courses. The additional two courses are taught by two tenured faculty in the epidemiology specialization who voluntarily adjusted their teaching responsibilities to offer support to the growing bachelor's degree. The BA PH program also has faculty who provide support for the field experience. Last year, the graduate-level practicum coordinator retired. Her replacement hire, (a tenure-track Associate Specialist), now serves as the shared field experience coordinator for placement and supervision of both graduate and undergraduate field experience requirements.

To support course instruction and student skill development, OPHS has also invested in graduate teaching assistant (TA) support. We originally TAs to help with the introductory courses, and have since added another. We are considering more growth in supporting student basic writing skills, with an additional position currently in recruitment for a writing TA to be shared with the MPH capstone class.

Budget

Since its development, the undergraduate program has been cost positive to our department. Our tuition revenue from the undergraduate program has helped to support OPHS overall as enrollment in graduate degrees has declined in Hawaiʻi, in a trend consistent across the US. While our personnel costs have expanded to meet growing student demand and increasing need for student support, our revenue from both general and tuition sources has been more than adequate.

3. Is the program efficient?

Program Enrollment

Given its high relevance to the workforce and student interests, the BA PH program has been growing rapidly. Our enrollments have consistently exceeded our original targets by three-fold, as is evidenced in Figure 1 below.

Figure 1. Enrollment

ENROLLMENT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Projected	20	30	40	50	50	50
Actual	**66**	**120**	**148**	**149**	**170**	**165**

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Program Completion

We have consistently exceeded our graduation targets for the program (see Figure 2) while maintaining our original commitment to operate without new resources. Past program needs have been met by reallocation of existing faculty and facilities resources within the department.

Figure 2. Completion

COMPLETION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Projected	N/A	N/A	N/A	N/A	20	30
Actual	0	11	33	56	40	46

Courses & Student Semester Hours Offered

Student semester hours have increased since initial program launch (see Figure 3). The number of courses offered initially increased, but have declined over the last two years due to limited instructional capacity to offer elective courses, and increased class size among required courses.

Figure 3. Courses, Sections, SSH

COURSES, SECTIONS, SSH	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
# Courses Offered	9	22	33	33	36	29
# Sections Offered	10	24	38	34	40	38
Annual SSH	486	1,701	2,494	2,352	2,270	2,599

Average Enrollment/Class Size Per Course

Course Number	Average Enrollment 2014-2020
PH201	77
PH202	36
PH203	35
PH210	36
PH310	25
PH341	29
PH420	26
PH480	28
PH485	21
PH489 (WI)	17

Service to Non-Majors

Non-majors can learn more about public health through our Minor in Public Health. The primary objective of the Public Health minor is to give students pursuing other degree programs a population/community perspective of health that has diverse applications for graduate

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programs and in health careers. Students will be able to make connections between their area of study and public health concepts including injury and disease prevention, laws and policies, and understanding health disparities. Non-majors can also choose to take PH 201 – Introduction to Public Health to satisfy the Social Sciences (DS) Diversification Requirement for general education requirements. This class is a major recruiting tool for public health as approximately 30% of students do decide to major in public health, and an additional 10-20% decide to minor. We believe this speaks to the relevance of public health to student needs, interests, and experiences.

Employment of Graduates
The BA PH program collects and analyzes data on graduates' employment or enrollment in further education post-graduation. Data collection methods are explicitly designed to minimize the number of students with unknown outcomes. Data for employment and post-graduation placement is collected within approximately one year after graduation, since collecting data shortly before or at the exact time of graduation will result in underreporting of employment outcomes for individuals who begin their career search after graduation. **The program achieves rates of 80% or greater employment or enrollment in continuing education.**

AY 2016 – AY 2018 BA PH Graduates Employment and Continuing Education

Employed	63
Continuing Education	39
Seeking Employment	7
Not Seeking Employment	5
Unknown	15

The BA PH program aims to support local workforce needs and contribute to the creation of today's global citizens and tomorrow's public health leaders. 48% of BA PH graduates are currently employed, while 30% of BA PH graduates have progressed to graduate degree programs. BA PH graduates are employed in various settings in the community including:
- American Lung Association- Hawai'i
- American Samoa Government
- Early Childhood Action Strategy
- Hawai'i Health & Harm Reduction Center
- HCAP- Honolulu Community Action Program
- Healthy Mothers, Healthy Babies
- HMSA
- PATCH- People Attentive to Children
- Queen's Medical Center
- UH Cancer Center
- UH Center on Aging

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Enrollment in Graduate Programs

The diversity of careers for which BA PH training is relevant can be seen in the array of areas students chose to pursue following graduation with a BA PH. The high percentage pursuing graduate study also clearly demonstrates the excellent training received in the program, recognized by their acceptance into graduate programs.

AY 2016 – AY 2018 BA in Public Health Graduates Continuing Education

Master in Public Health	16
Master in Social Work	2
Master in Health Admin	1
Master of Science Nutrition	1
PharmD	1
Juris Doctor	1
Medical School (DO)	2
Peace Corps	1
Education	
MEd/EDEA	1
MEd/Elem	1
Nursing	
Pre-Nursing	1
BSN	3
MSN	7
DNP	1

Recruitment Activities

The BA PH program recruits actively, primarily in recruitment events within our local community. It is a priority for the program to participate in outreach events within the UH Mānoa Campus and UH System including Mānoa Experience, Teen Health Camp, and UH Transfer Days, which we have attended since 2012. In addition to UH specific events, we also attend high school college and career days, and community events such as Micronesian Day to build awareness about our program and the opportunities available to students interested in studying public health and pursuing a health career. The value of attending recruitment events extends beyond promoting our program but it also is a chance for us to continue to promote the University of Hawai'i and the value of higher education. It is also a chance to promote Public Health to students who are typically more familiar with classic clinical health degrees such as MD or Nursing.

4. Evidence of student learning, and student and program success.

Program Assessment Plan

We carefully evaluate our program to maintain continuous improvement, ensure student satisfaction, and remain responsive to areas requiring improvement. The evaluation system was developed to address program improvement and validation, demonstrate responsiveness of

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the program to student needs, and satisfy CEPH accreditation and UHM institution requirements. A BA-specific evaluation plan is necessary because program goals and students can differ from those of graduate degree programs, in terms of measurements of success, length and depth of curriculum, and varying learning and instructional styles.

Assessment data has been used as evidence to justify the hire of two tenure-track faculty members (one beginning in August 2017 and another to begin in January 2019), as well as to support three teaching assistants (one dedicated to writing skill development and support, one dedicated to quantitative skill development and support, and one dedicated to support of a large public health introductory course). Assessment data have also been used to identify gaps in SLO achievement, which has led to various course and program improvements.

Exit Surveys (AY 2015-16 through 2018-19)
The Exit Survey is administered to graduating students in the program. Important measures of quality such as quality of instruction, and faculty expertise have been consistently rated as excellent or good by over 85% of students who responded to the exit survey. In several years these numbers surpassed 90%. Academic and career advising was also rated as excellent or good by the vast majority of respondents, frequently by over 90%. The percent of respondents rating the student body diversity as excellent or good was consistently over 85%, and the students who rated space and classroom facilities as excellent or good was consistently over 80%. Overall, the exit survey results demonstrate high levels of student satisfaction with various aspects of the BA PH program.

Other Indicators of Program Quality
We have published a number of articles about this program, and students from this program have published work completed through degree requirements, both indicating the utility to peers and the field of public health in general.

Publications Focused on the BA PH Program

Peer-Reviewed Journal Articles
Nelson-Hurwitz DC, & Buchthal OV. (2019). Using Deliberative Pedagogy as a Tool for Critical Thinking and Career Preparation Among Undergraduate Public Health Students. *Frontiers in Public Health*, 7, 37. DOI: 10.3389/fpubh.2019.00037.

Nelson-Hurwitz DC, Kehl L, & Braun KL. (2019). Aloha Undergraduates: Development and Application of Local and Indigenous Topics into an Undergraduate Public Health Curriculum. *Frontiers in Public Health*, 7, 16. DOI: 10.3389/fpubh.2019.00016.

Nelson-Hurwitz DC, Buchthal OV, Tagorda M, & Braun KL. (2018). Adding a Baccalaureate Degree to a Graduate Public Health Program While Addressing Stakeholder Concerns. *Pedagogy in Health Promotion*. DOI: 10.1177/2373379918794703.

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Nelson-Hurwitz DC, Tagorda M, Kehl L, Buchthal OV, & Braun KL. (2018). Developing an Undergraduate Public Health Introductory Core Course Series. *Frontiers in Public Health*, *6*, 155. DOI: 10.3389/fpubh.2018.00155

Nelson-Hurwitz DC, & Tagorda M. (2015). Developing an undergraduate applied learning experience. *Frontiers in Public Health*, *3*. DOI: 10.3389/fpubh.2015.00002

Non-Peer Reviewed (Editorial Review) Journal Articles
Braun KL, Nelson-Hurwitz DC, Ono M, Godinet M, Perkinson M, & Mokuau N. (2017). From *Hale* to *Kauhale*: Public Health, Social Work, and Aging. *Hawaiʻi Journal of Medicine & Public Health*, 76(4), 135.

Nelson-Hurwitz DC, Arakaki LA, & Uemoto M. (2017). Insights in Public Health: Training Today's Students to Meet Tomorrow's Challenges: Undergraduate Public Health at the University of Hawaiʻi at Manoa. *Hawaiʻi Journal of Medicine & Public Health*, 76(3), 89.

Book Chapters
Nelson-Hurwitz DC, & Tagorda M (2015). Developing an undergraduate applied learning experience. *Undergraduate Education for Public Health in the United States*, pp. 43-45. [republished as book chapter from journal article]

Student Publications Resulting from BA PH Experience (student in bold/underline)

Peer-Reviewed Journal Articles
Cooney RV & **Wagner JC.** (2017). Elevated Levels of Circulating γ-Tocopherol as a Surrogate Marker of Mortality Risk in Populations of Adult Men Stratified by Health Index Score. *The FASEB Journal*, *31*, 460-7.

Davis CMA, Guo M, Miyamura J, Chang A, Nelson-Hurwitz DC, & Sentell T. (2017). Key Factors in Obstetric Delivery Decision-Making among Asian and Pacific Islander Women by English Proficiency. *Hawaiʻi Journal of Medicine & Public Health,* 76(10), 279.

Editor-Reviewed Journal Articles
Tong M & Sentell T. Insights in Public Health: Challenges Investigating Health Outcomes in Chinese Americans Using Population-Based Survey Data. *Hawaiʻi Journal Medicine and Public Health.* 76 (1): 27-32.

Sophus AI, Fujitani L, Vallabhbha S, Antonia J, **Yang PL**, **Elliott E**, & Mitchell JW. (2018). Insights in Public Health: In what ways are Hawaii's HIV prevention services engaging gay male couples and using technology? *Hawaiʻi Journal of Medicine & Public Health.* 77(2): 38-45.

Manuscripts Submitted, Pending Review

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Asato C, Nelson-Hurwitz DC, Lee TH, & Grandinetti A. Comparative Analysis of Metabolic Syndrome Diagnostic Criteria and its Effects on Prevalence in a Multi-Ethnic Population. *Asia Pacific Journal of Public Health*. (Submitted 1/13/2020)

Yang PL, Katz AR, & Nelson-Hurwitz DC. Evaluating Potential Mosquito Breeding Sites on a University Campus. *Hawaiʻi Journal of Health & Social Welfare*. (Submitted 2/3/2020)

Book Press Published
"What I Chose" by **Madisyn Uekawa**
(Published by CreateSpace Independent Publishing Platform)

Awards to Faculty and Students

2019-2020	Nominee, University of Hawaiʻi at Mānoa Excellence in Teaching Award (Denise Nelson-Hurwitz)
2019-2020	Nominee, Frances Davis Award for Excellence in Undergraduate Teaching (Chevelle Davis)
	Graduate Division Awards, University of Hawaiʻi at Mānoa
2018-2019	Nominee, University of Hawaiʻi at Mānoa Excellence in Teaching Award (Denise Nelson-Hurwitz)
2017	Delta Omega Award for Innovative Public Health Curriculum, Honorable Mention PH 480: Application of Public Health Principles in Research and Practice
2017	Frances Davis Award for Excellence in Undergraduate Teaching University of Hawaiʻi at Mānoa (Denise Nelson-Hurwitz)
2016	Social Sciences Poster Presentation, Best Presentation (Sasha Madan) Honors 2016 Spring Undergraduate Showcase of Research and Creative Work, University of Hawaiʻi at Mānoa, Honors Program
2016	Social Sciences Poster Presentation Honorable Mention (Chevelle Davis) Honors 2016 Spring Undergraduate Showcase of Research and Creative Work, University of Hawaiʻi at Mānoa, Honors Program
2016	Social Sciences Oral Presentation, Best Presentation (Sasha Madan) Honors 2016 Spring Undergraduate Showcase of Research and Creative Work, University of Hawaiʻi at Mānoa, Honors Program
2016	Social Sciences Oral Presentation Honorable Mention (Chevelle Davis) Honors 2016 Spring Undergraduate Showcase of Research and Creative Work, University of Hawaiʻi at Mānoa, Honors Program
2016	Honorary Faculty Inductee (Denise Nelson-Hurwitz) National Society of Collegiate Scholars, University of Hawaiʻi at Mānoa
2015	Undergraduate Showcase for Research and Creative Work (Michelle Tong) Honorable Mention Award at the 2015 Undergraduate Showcase for Research and Creative Work (Honors/Undergraduate Research Opportunities Program)

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5. Are program objectives still appropriate functions of the College and University?

Relationship to State, University, Campus Mission and Development Plans

The Bachelor of Arts in Public Health offers many benefits for the University, its students, and the State. The program provides a pool of more knowledgeable candidates for graduate-level programs, provides more collaborative opportunities to Office of Public Health Studies and its other UH system partners interested in offering public health opportunities to its students, and more appropriate training for undergraduate students interested in a public health career.

According to the U.S. Department of Labor, the health sciences field represents the largest single industry in the U.S., accounting for 14.3 million jobs across 200 different fields. In addition, seven of the 20 fastest growing occupations are health-related, generating 3.25 million new jobs between 2008 and 2018, a 22 percent increase, or double the growth of all other industries combined. In the future, it is anticipated there will be a growing need for health promotion professionals as a result of rising incidence of chronic disease, rising health care costs driving intervention strategies, increased need for research in the area of disease prevention, the aging work force, technological advances, and increased demand for consultants.

The public health workforce in the U.S. is diminishing, with 23% of the current workforce (almost 110,000 workers) eligible for retirement by 2012. Nationally, existing schools of public health would have to train nearly three times the number of current graduates to meet this projected demand. From the viewpoint of the surrounding region, the burden of non-communicable diseases (NCDs) pose a serious public health threat, as referenced in Pacific Islands Health Officers Association (PIHOA) Board Resolution #48-01. PIHOA is made up of all of the directors and ministers of health of the U.S. Affiliated Pacific Islands (USAPI) jurisdictions, all of whom have stated, for the record, their strong support of public health training in order to improve the capabilities of their departments.

Uniqueness of the Public Health Program within the UH System

An undergraduate degree in public health has never previously been offered within the UH system. UHM launched its Public Health program in 1962 and graduated its first class of graduates in 1964; for the last 50 years, however, only graduate degrees have been offered.

Of the seven UH campuses contacted in Spring 2012, three of these UH campuses indicated interest in the proposed Bachelor of Arts in Public Health program at UHM. The Chancellor and Dean of Health Sciences at Kapiʻolani Community College (KCC) indicated an interest in potentially offering an associate's degree in public health. Windward Community College (WCC) has expressed an interest in offering the required Intro to Public Health (PH201) course. WCC also indicated an interest in student transfers to the Bachelor of Arts in Public Health program at UHM when they have completed the necessary prerequisites at WCC. The University of Hawaiʻi at West Oʻahu currently offers a Bachelor of Arts in Public Administration with a

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specialization in Healthcare Administration, and a Bachelor of Arts in Public Administration with a community health specialization. The University of Hawai'i at Hilo offers a Bachelor of Arts in Kinesiology and Exercise Science with a Health Promotion track. Outside the UH system, Hawai'i Pacific University currently offers a Bachelor of Science in Health Sciences which enrolls well over 100 students per year.

Evidence of Continuing Need of the Program

The Hawai'i DOH has numerous vacant positions to be filled by a trained public health workforce, including undergraduates. Our new relationship with Kaua'i shows the continued relevance of this program for training to workforce needs. As our population ages along with increases in chronic disease and other health issues, there is only growing need for public health training and positions. We are asked by major entities from DOH, to Hawai'i Pacific Health to local non-profits and community health centers, to entities in state legislature, to non-health-related organizations such as Department of Education, for student trainees to engage in capstone experiences because of vast opportunities for student contributions in the field. As students complete their required capstone experiences, they subsequently provide valuable direct public health services to the UHM campus community (e.g. through support of on-campus health promotion events), local organizations (e.g. the Hawai'i Public Health Institute, Office of Hawaiian Affairs, and City & County of Honolulu Office of Climate Change, Sustainability, & Resiliency), and professional public health community through scholarly contributions to the literature and workforce.

Projections of Employment Opportunities for Graduates

The employment opportunities for graduates of the BA PH program are high. At the state level, there is a recognized need by the public health sector for more education and training, not only for our current public health workforce, but also for our future public health workforce, given the projected pending retirement of almost 25% of our current public health workforce in Hawai'i along (estimated at 565 retirees). With the anticipated implementation of accreditation requirements in the future for State Departments of Health, the need for a qualified workforce with relevant accredited degrees will become paramount. The structure and goals of the Bachelor of Arts in Public Health program fits well to address access and affordability to higher education for Hawai'i students, to undertake more community outreach and promote public support for UHM as a research resource for the state, and to expand professional programs such as public health in order to promote workforce development and new career and employment opportunities for UH students. Employers for our graduates include the State Department of Health, the Center for Disease Control, non-profit organizations dealing with health-related issues, healthcare providers, insurance companies, academic researchers, and community organizations, both public and private.

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UNIVERSITY OF HAWAI'I
BOARD OF REGENTS

20   MAY -1   P2:31

April 16, 2020

RECEIVED

MEMORANDUM

'20   MAY -1   P2:02

UNIVERSITY OF HAWAII
PRESIDENT'S OFFICE

TO: Benjamin Asa Kudo
           Chair, Board of Regents

VIA: David Lassner
           President

VIA: Donald O. Straney
           Vice President for Academic Planning and Policy

FROM: Bonnie D. Irwin
           Chancellor

SUBJECT: REQUEST APPROVAL TO CHANGE FROM PROVISIONAL TO
           ESTABLISHED STATUS, BACHELOR OF ARTS IN PHARMACY
           STUDIES AT THE UNIVERSITY OF HAWAI'I AT HILO

SPECIFIC ACTION REQUESTED:

Request approval to change from provisional to established status, for the Bachelor of
Arts in Pharmacy Studies (BAPS) in the Daniel K. Inouye College of Pharmacy at the
University of Hawai'i at Hilo.

RECOMMENDED EFFECTIVE DATE:

Effective upon Board approval.

ADDITIONAL COSTS:

There are no additional costs associated with this request.

200 W. Kāwili St.
Hilo, Hawai'i 96720-4091
Telephone: (808) 932-7348
Fax: (808) 932-7338
hilo.hawaii.edu
An Equal Opportunity/Affirmative Action Institution

PURPOSE:

The Bachelor of Arts in Pharmacy Studies (BAPS) prepares students currently pursuing study in the Doctor of Pharmacy (PharmD) program to earn a Bachelor's degree acknowledging their completion of general education requirements and coursework in the basic sciences. The BAPS degree is not designed to lead to professional licensure, but enables students to pursue numerous educational and career opportunities in Pharmacy or other Healthcare Professions, or to continue on to further studies in research, business or academia that would require an undergraduate STEM degree.

BACKGROUND INFORMATION:

Board of Regents Policy 5-1 b (3) states that "the Board shall determine whether the program is to be awarded established status or terminated."

The Bachelor of Arts in Pharmacy Studies Degree (BAPS) was originally proposed to provide pharmacy students with a true undergraduate degree to accompany their professional Doctorate of Pharmacy Degree. Students earning the BAPS degree are recognized for their accomplishments in completing a rigorous course of study, with a strong foundation in liberal arts and basic sciences, and upper division work concentrated in the essentials in the science and practice of Pharmacy. Graduates with only the professional degree can potentially run into roadblocks later in their careers if they decide to enter another field where a true undergraduate STEM degree is required or if they continue on in research, business, or academia. Having the accompanying Bachelor's degree signals to employers that our graduates are also prepared with a much broader background than typical Pharmacists with only the professional degree. This makes them better candidates for managerial positions and allows greater mobility in the workforce.

There are no direct workforce demands for this degree. It is an ancillary degree to the Doctor of Pharmacy degree, which is the field that most students will work in. The projected enrollment in the BAPS program was originally estimated at 40 per cohort year, when the proposal was prepared for the BOR in 2010. Total enrollment for the two-year program was therefore expected to be 80. However, student interest in the program exceeded these original projections, with total enrollment ranging from 155 to 175 in a given year. In Fall 2019, the enrollment dropped to 126, reflecting a similar drop in new admissions of PharmD students. While the total number of PharmD students is expected to be lower in the coming years, more than 90% of the enrolled students will choose this option based on past enrollment.

To date, approximately 631 students have been awarded the BAPS degree and enrollment has consistently exceeded projections.

This degree has no effect on the accreditation of either the Daniel K. Inouye College of Pharmacy or the University of Hawaiʻi at Hilo.

There are only three similar programs that we have identified in the nation. All are similar to the DKICP BAPS program in allowing students to earn a Bachelor's degree *en route* to earning a PharmD degree.

- Eshelman School of Pharmacy - University of North Carolina
- Wegmans School of Pharmacy - St. John Fisher College
- Bill Gatton College of Pharmacy - East Tennessee State University

There are no other programs similar to this across the University of Hawaiʻi System.

Throughout their educational experience, students in the DKICP BAPS program are engaged in both classroom-based and experiential settings and are challenged both individually and in team-based exercises in ways that stimulate creativity, resourcefulness and the development of real-world problem-solving skills. Through our community service and outreach efforts, the DKICP seeks to improve the health and wellness of local populations; and provide critical healthcare professionals to Hawaiʻi's workforce. The Vision Statement of the DKICP is "to drive improvement of healthcare in Hawaiʻi and throughout the Pacific." The DKICP seeks to achieve this Vision by: focusing on Hawaiʻi's uniqueness in its culture, physical setting and geography; employing world-class faculty; and graduating exceptional professionals. The DKICP is dedicated to seeing our students graduate with the knowledge, skill sets, and abilities in innovation and leadership that enable them to succeed in the workforce.

The BAPS program is housed entirely within the DKICP, and shares facilities with the PharmD and PhD in Pharmaceutical Sciences degree programs. Because the BAPS is integrated within the PharmD degree program and students must also be enrolled as PharmD students, no additional space is required to offer the BAPS degree.

The BAPS degree is earned concurrently with coursework leading to the PharmD, there are no additional tuition costs for our students nor significant administrative costs. The BAPS degree is unique at UH Hilo and within the UH system, in offering students the opportunity to earn a Bachelor's-level degree in Pharmacy Studies. Data of students surveyed at the DKICP reveal that the BAPS degree has significant value in addition to holding a PharmD. BAPS students see benefit in their educational portfolios and

eventual attractiveness to employers, should they seek employment in areas other than as a licensed Pharmacist, such as marketing, sales, or regulatory affairs.

In recognition of the demonstrated value, efficiency and accomplishments of the DKICP BAPS degree program at UH Hilo, we kindly request your support to grant its advancement from provisional to established status.

ACTION RECOMMENDED:

Recommend approval to change from provisional to established status, for the Bachelor of Arts in Pharmacy Practice (BAPS) in the Daniel K. Inouye College of Pharmacy at the University of Hawaiʻi at Hilo.

Attachment: Proposal for Established Status

c: Executive Administrator and Secretary of the Board Oishi

Provisional to Established Proposal

Bachelor of Arts in Pharmacy Studies (BAPS) Degree Program

The Daniel K. Inouye College of Pharmacy (DKICP) University of Hawai'i at Hilo

Date of Proposal: March 18, 2020

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1. Program Overview

1.1 Purpose of the Program

The Bachelor of Arts in Pharmacy Studies (BAPS) degree program at the Daniel K Inouye College of Pharmacy (DKICP) acknowledges students who complete a minimum of four years of college education including rigorous course work in the basic sciences and practice of pharmacy. Students earning the BAPS degree attain broad knowledge in the liberal arts and basic sciences, as well as advanced training in the field of pharmacy that is both academic and experiential in nature. The degree program is comprised of 133 semester credits of study, including 66 transferred semester credits (approximately 2 academic years) of pre-pharmacy study, and an additional 67 required semester credits, which are earned during the first two years of study in the DKICP PharmD program. To participate in the BAPS degree program, students are required to be concurrently enrolled in the DKICP PharmD program. The BAPS degree is not designed to lead to licensure as a professional pharmacist. However, the BAPS degree enables students to pursue numerous educational and career opportunities in diverse areas, including pharmacy and other healthcare professions, or they may continue on in research, business, or academia.

Offering the BAPS degree adds significant value for students and faculty at the DKICP. Much of the PharmD student body views the BAPS degree as an attraction to enrollment at UH Hilo, and it is commonly cited as one of the reasons for selecting the DKICP over other colleges of pharmacy. Thus, from a recruitment perspective, the BAPS degree serves to attract and retain students that have strong academic records, and who are motivated to succeed in the program. From a student perspective, holding a BA and PharmD together increases their attractiveness to potential employers and provides them with recognition of the additional coursework. Accordingly, since about 30% of PharmD students at the DKICP do not hold an undergraduate degree, the BAPS is valuable if they ever decide to seek employment in a career other than as a licensed Pharmacist (e.g. pharmaceutical sales, regulatory affairs, public relations).

1.2 Links to Supporting Information on the BAPS Program
- Appendix A: Catalog Description
- Appendix B: Admissions
- Appendix C: Curriculum Map and Course Listing
- Appendix D: Changes Since Provisional Approval
- Appendix E: List of Faculty and Area of Expertise
- UH Hilo Catalog Page (https://hilo.hawaii.edu/catalog/pharmacy-studies.php)
- DKICP Program Description (http://pharmacy.uhh.hawaii.edu/academics/bachelor-arts-pharmacy-studies)
- DKICP Faculty bios

1.3 Date of BOR Provisional Approval

February 24, 2011

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1.4 Reason for Delay in Seeking Established Status

The application for established status was postponed for the following reasons:

- Extension 1: Fall 2016, Reason: Full review and accreditation of PharmD program by ACPE;
- Extension 2: Fall 2017, Reason: Transition in leadership, new Interim Associate Dean for Academic Affairs;
- Extension 3: Fall 2018, Reason: Request to await and follow updated BOR guidelines and template document for provisional to established proposals.
- Extension 4: Fall 2019, Reason: College wide curriculum and program review taking place at DKICP

1.5 Enrollment Data

The projected enrollment in the BAPS program was originally estimated at 40 per cohort year, when the proposal was prepared for the BOR in 2010. Total enrollment for the two-year program was therefore expected to be 80. However, student interest in the program exceeded these original projections, as can be seen in the table, below.
*Note data for Fall 2010 includes enrollment numbers for the class of 2011, 2012, 2013.

Table I. BAPS Program Enrollment

Enrollment (Fall Headcount)	*Fall 2010	Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019
Projected: BAPS	80	80	80	80	80	80	80	80	80	80
Actual: BAPS	340	176	178	176	166	148	151	157	159	126

1.6 Class Size

Students are admitted by cohort into the DKICP PharmD program in the fall semester of each year. Admission into the PharmD program is a prerequisite for entry into the BAPS program. Beginning Fall 2019, the target class size is 50 students with a max of 70. The average ratio of resident/non-resident students is currently 70%/30%.

1.7 Student Progression

Progression through the program is dependent upon students achieving satisfactory grades of "C" or better. Students who fail one or more courses in a given semester are reviewed by the Student Promotion and Graduation Committee (SPGC), which is composed of members of the DKICP faculty and the Associate Dean for Academic Affairs (ADAA- ex-officio). This committee is responsible for enforcing the faculty and ACPE established academic standards and to assure that students meet all required standards for progression.

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Students are promoted to the next academic year given satisfactory completion of required coursework and provided that all tuition and fees have been paid. If a student fails to complete the prescribed course of study, the student's status of progression is submitted to the SPGC. Committee progression decisions include but are not limited to: course remediation (which is completed during summer); placement on an extended track (student being permitted to take two years to complete one year of didactic coursework); or dismissal. The committee follows faculty-approved guidelines for student promotion in making such decisions. Students have opportunity to be heard before the committee and file an appeal of the committee's decision(s) with the College Dean.

1.8 Completion Data

Projected numbers of BAPS degrees are based on student enrollment in the BAPS program during their first (P1) and second (P2) year in the DKICP PharmD degree program. Degrees are awarded upon completion of four-year PharmD degree, or upon early departure from the PharmD program after successful completion of BAPS credits. Projection of students joining the BAPS program was originally estimated at 40 per cohort year in the request for provisional status. With the exception of 2013, participation in the program has been higher than expected. To date, 695 students received both the BAPS and PharmD degrees.

Table II. BAPS Program Completion Data

Completion (Annual)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Projected: BAPS	40	40	40	40	40	40	40	40	40	40	
Actual: BAPS	49	86	34	79	88	85	73	68	69	64	695

2. Program Resources

2.1 Instructional Faculty

The courses taken during the first two years of undergraduate study are identical to the application requirements for the PharmD program and thus do not incur any additional instructional cost for any other units at UH Hilo. Because the BAPS program is integrated within the DKICP PharmD program, no additional instructors or program resources are needed to run the BAPS degree program. Personnel costs for the BAPS degree program are covered entirely by the operating budget of the DKICP PharmD program. DKICP faculty are distributed between two departments: Pharmaceutical Sciences, and Pharmacy Practice. A breakdown of faculty rank and departmental affiliation is shown below.

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Department	Employees at Rank	Rank
Pharmacy Practice	7	Assistant Professor
Pharmacy Practice	4	Associate Professor
Pharmacy Practice	2	Professor
Pharmacy Practice	2	Assistant Specialist
Pharmacy Practice	1	Associate Specialist
Pharmacy Practice	1	Specialist
Pharmaceutical Sciences	2	Assistant Professor
Pharmaceutical Sciences	5	Associate Professor
Pharmaceutical Sciences	2	Professor

2.2 Faculty Support

Numerous opportunities at the DKICP and UH Hilo are available to faculty seeking support for professional development, research, and scholarly interests.

The DKICP has provided financial support in the form of travel funds for faculty to attend workshops or conferences related to their professional expertise, or to enhance their teaching skills. The College also provides financial support through laboratory supplies and pays for maintenance contracts of major lab equipment if the operations budget allows. The DKICP also has a faculty-governed Faculty Development Committee, which provides assistance on:

- teaching (e.g. methods and approaches; classroom tools and technologies; information resources)
- professional development (e.g. new faculty orientation; contract and tenure workshops and materials; research support)
- professional training (e.g. FERPA; EEO; academic policies)

The DKICP also provides administrative support, including Department secretaries and support staff, to assist with tasks related to faculty teaching, scholarship, or service endeavors. The DKICP fiscal officer assists in the post-award management of faculty-acquired grants and travel for professional development or scholarly activities.

2.3 Changes to BAPS Program Since BOR Provisional Approval

Since the BAPS is integrated within the PharmD degree program, no additional course offerings are required. However, following provision approval of the BAPS program in 2011, revisions to the DKICP PharmD curriculum have resulted in a number of moderate changes to the course and credit requirements for the BAPS degree, as listed in **Appendix D**. The majority of courses are offered as only a single section, since students in the BAPS and PharmD programs progress together as cohorts, and have a set schedule of classes, with the exception of (4) credits of elective coursework.

The Faculty Senate Curriculum and Assessment Committee is the faculty body that is responsible for the review and evaluation of the PharmD and BAPS curriculum. The Committee makes recommendations to the DKICP faculty for changes in consultation with the ADAA.

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During the 2015-16 academic year, the Curriculum Committee requested that the coordinators of foundational courses conduct a comprehensive review of course content and instructional materials (handouts, slides, homework) to ensure that it was of the appropriate depth and breadth to meet the programmatic learning objectives and accreditation standards for the BAPS and PharmD programs. The changes outlined in **Appendix D** are the result of this review process.

2.4 Cost for DKICP to Offer BAPS Degree

There is no additional cost to the DKICP to offer and operate the BAPS degree. Processing of the transferred credits for Years 1-2 of the BAPS degree must already be performed in order to verify the required prerequisites for admission into the PharmD program. The subsequent components of the BAPS are based on students taking years 1-2 of the PharmD curriculum.

2.5 Program Budget

Enrollment in the BAPS degree program is open only to students that are concurrently enrolled in the DKICP PharmD program. Because it is run concurrently, offering the BAPS degree incurs no additional operational costs for the DKICP, and no additional tuition for students. Current tuition rates for the DKICP PharmD program (with or without concurrent enrollment in the BAPS program) for the 2019-20 academic year is $24,096 for residents and $41,040 for nonresidents. For academic years 2014-2016 tuition increases were 6% and 3% for nonresident and resident students, respectively. For the 2017-18 and 2018-19 academic years, a 1% increase in tuition was approved by the UH Board of Regents for three years. Entering class size is targeted at 50 with a max enrollment of 70. Approximate distribution of 70% resident and 30% nonresident students. This past fall 2019, the entering class size was 50.

General Funds and Tuition/Special Fund Allocation (Lump Sum) allocations for the current year are approximately $9 million. Personnel (instructional and support) costs are approximately $6.37 million and operational (equipment, supplies, utilities, administrative) costs are approximately $2.63 million. The DKICP also continues pay bond debts on a $5 million revenue bond for the permanent building Hale Kīhoʻihoʻi and a $3 million revenue bond for the DKICP modular buildings. In addition, $80,000 per year is directed towards R&R. A breakdown of the DKICP budget, starting with the first provisional year of the BAPS program in 2011, is provided below, as based on the Guidelines for Assessment of Provisional Programs.

Table III. DKICP Operating Budget

College Resources/ Funding	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
General Fund	$1,377,701	$1,512,818	$1,512,818	$1,629,270	$1,711,367	$1,817,448
Tuition	$8,095,429	$10,372,635	$10,103,496	$9,894,056	$9,492,175	$8,499,025
Summer Allocation	$0	$0	$0	$0	$0	$0
Program/Course Fee Allocation	$0	$0	$0	$0	$0	$0
Research Revenue	$7,527,908	$1,983,997	$1,195,930	$743,830	$212,747	In progress
Budget Shortfall	$0	$0	$0	$0	$0	$0

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3. Program Success

3.1. Program Accreditation and External Evaluation

Undergraduate programs at UH Hilo, including the BAPS program, are accredited by the Senior Commission of the Western Association of Schools and Colleges (WASC). This accreditation of UH Hilo was reaffirmed in March 2015 for a period of 7 years. The next WASC review of UH Hilo is scheduled for 2021, with site visits scheduled for Fall 2020. For students transferring credits from other institutions, only coursework taken at a regionally-accredited U.S. institution in which a letter grade of "C" or better are considered. In addition, upper-division coursework in the BAPS degree program, which is taken at the DKICP, is also subject to accreditation by the Accreditation Council for Pharmacy Education (ACPE), which oversees the accreditation of PharmD degree programs in the United States. In 2017, the DKICP was granted an 8-year full accreditation until 2025. The DKICP submits annual reports to the ACPE in the areas of organization and governance; curriculum design and oversight; interprofessional education; physical and financial resources; and educational outcomes related to co-curricular student activities.

3.2 Professional Certifications

As added value on their way to earning the BAPS degree, DKICP students achieve certifications in the following healthcare-related areas: CPR training; immunization training; tobacco cessation counseling; HIPPA training.

3.3 Student Satisfaction

The American Association of Colleges of Pharmacy (AACP) administers an annual satisfaction survey of recent College of Pharmacy graduates. Based on most recent 2019 data, over 95% of UH Hilo DKICP graduates strongly agreed/agreed that they can provide patient-centered care based on evidence-based best practices. Over 95% felt that their pharmacy practice experiences allowed them to have direct interaction with diverse patient populations. Also, over 80% of our students feel prepared to enter practice as a pharmacist immediately after graduation.

4. Conclusions

4.1 Relationship to Strategic Plan

Throughout their educational experience, students in the DKICP BAPS program are engaged in both classroom-based and experiential settings and are challenged both individually and in team-based exercises in ways that stimulate creativity, resourcefulness and the development of real-world problem-solving skills. In this respect, the Mission of the DKICP is in alignment with the UH Hilo Mission statement: *"'A 'ohe pau ka 'ike i ka hālau ho 'okahi. One learns from many sources."* and its first aim:

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- *To challenge students to reach their highest level of academic achievement by inspiring learning, discovery and creativity inside and outside the classroom.*

Through our community service and outreach efforts, the DKICP seeks to improve the health and wellness of local populations; and through our research endeavors, we stimulate innovation and discovery in both the science and practice of Pharmacy, in ways that impact both local and global healthcare. In this regard, the DKICP Mission is in alignment with the second aim of the UH Hilo Mission statement:

- *To improve the quality of life of the people of Hawai'i, the Pacific region and the world.*

In addition, The Vision Statement of the DKICP is "to drive improvement of healthcare in Hawai'i and throughout the Pacific." The DKICP seeks to achieve this Vision by: focusing on Hawai'i's uniqueness in its culture, physical setting and geography; employing world-class faculty; and graduating exceptional professionals. The DKICP is dedicated to seeing our students graduate with the knowledge, skill sets, and abilities in innovation and leadership that enable them to succeed in the workforce. In this way, the Vision of the DKICP is in alignment with the UH Hilo Vision statement: *"E lawe i ke a'o a mālama, a e 'oi mau ka na'auao. Those who take their learnings and apply them increase their knowledge."*

4.2 Relationship to Facilities Plan

The BAPS program is housed entirely within the DKICP, and shares facilities with the PharmD and PhD in Pharmaceutical Sciences degree programs. Because the BAPS is integrated within the PharmD degree program and students must also be enrolled as PharmD students, no additional space is required to offer the BAPS degree. As of February 2020, the DKICP occupies three sites in Hilo: the new permanent building Hale Kīho'iho'i, the DKICP modular buildings at 722 S. A'ohoku Pl. and the Waiakea Research Station (WRS) at 924 Stainback Hwy. There are plans to relocate faculty labs from WRS to the DKICP modular campus on A'ohoku Pl. when the modular space is retrofitted for the research labs.

4.3 Relationship to Other Programs in the University of Hawai'i System

The BAPS is unique in that it is the only Bachelor-level degree program in the UH system that is focused on educating students in the science and practice of Pharmacy. UH Hilo also offers Bachelor's degrees in related STEM and healthcare fields, including: Biology (BA); Biology: Cell, Molecular, and Biomedical Sciences (BS); Biology: Ecology, Evolution, and Conservation (BS); and Nursing (BS). The goal of the UH Hilo Pre-Pharmacy program is to advise UH Hilo undergraduate students on pre-requisite coursework for admission into Pharmacy school. However, the Pre-Pharmacy program at UH Hilo is not a degree-granting program, nor does it lead to an educational certificate. Pre-Pharmacy advising is coordinated through the Exploratory Health Science program located on UH Hilo's main campus.

The DKICP leverages the presence of other professional degree programs in the State of Hawai'i to prepare our students to work effectively as members of interprofessional healthcare teams. Through the Hawai'i Interprofessional Education (HIPE) workgroup, the DKICP and UH Hilo

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Nursing programs, along with the John A. Burns School of Medicine (JABSOM), UH Manoa School of Nursing and Dental Hygiene (SONDH), and Myron B. Thompson School of Social Work and Programs for Public Health, cooperate in holding joint exercises in interprofessional communication and problem-solving for BAPS/PharmD, Nursing, Medicine and Social Work students. The Council for Health Sciences and Social Work (CHSSW), composed of the deans from Medicine, Nursing, Pharmacy, and Social Work provides oversight to the HIPE workgroup.

The BAPS is distinct from other undergraduate degree programs in the UH system in providing both a foundational and applied (didactic and experiential) education in Pharmacy-specific topics, including medicinal chemistry; pharmacology; pharmacotherapy; pharmacokinetics; drug compounding; medical terminology and Pharmacy communication. In earning the degree, students with a BAPS are well positioned to enter the workforce in either a healthcare or STEM-related profession, or to pursue advanced degrees (MS, PhD) in the biomedical or pharmaceutical sciences.

4.4 Continued Need for BAPS Program

Student recruitment efforts are planned and managed by the DKICP Office of Academic and Student Affairs. As mentioned prior, Pre-Pharmacy advising is coordinated through the Exploratory Health Science program located on UH Hilo's main campus. The DKICP Office of Student Affairs also assists students applying to the PharmD program. In addition, the UH Hilo Pre-Pharmacy Club, which is a UH Hilo registered independent student organization (RISO), is advised by a faculty member of the DKICP. In regards to recruitment, DKICP coordinates participation in graduate school and career fairs on neighbor islands, and on the mainland.

The DKICP is cognizant that demand for the PharmD degree is governed by market forces and the need for registered pharmacists. The Pharmacy Workforce Center (PWC) is an organization which collects, analyzes and disseminates data on the supply of licensed pharmacists and the demand for pharmacy services in the United States. The PWC (https://pharmacymanpower.com) publishes a quarterly report on the balance between supply and demand, termed the Pharmacist Demand Indicator (PDI). Estimates of job supply and demand are based on the perceptions of individuals that participate in the hiring of pharmacists on a direct and regular basis and represents the major geographic and practice sectors of pharmacy practice. Participants are asked to rate on a scale from 1 (low demand) to 5 (high demand) for hiring pharmacists. A ranking of 3 indicated that supply is in balance with demand.

The most recent data is as follows:

- Hawai'i Quarter 1 of 2018, with a ranking of 2.33 (updated information not reported due to lack of panelists reporting)
- West Region (which includes Hawai'i) Quarter 4 of 2018, with a ranking of 2.91 (although this data includes California which does report as North California and South California and may skew the data for other states in the region)

The BAPS degree program adds significant value to the DKICP and is important in student recruitment. A survey, administered in Feb 2018, of current students and alumni show that

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approximately half of our student body views the BAPS degree as a valuable attraction, and is listed as one of the reasons that they chose to attend our college, as shown in **Table IV**. Therefore, from a recruitment perspective, the BAPS degree serves to attract strong applicants to the DKICP PharmD program. As an added value to the PharmD program, another intended benefit to offering the BAPS program is to retain future students after acceptance into the DKICP PharmD program.

Table IV. Student Survey on BAPS Degree Attracting PharmD Applicants

Graduating classes surveyed		2011-18
Number of students contacted		553
Number of respondents		193
Response rate		34.9%
Q. To what extent do you agree to the following statement: Offering the BAPS degree at DKICP attracts applicants to our PharmD program.		*Percent of respondents*
	Disagree or strongly disagree	26.9%
	Neutral	25.9%
	Agree or strongly agree	**47.2%**

From a student perspective, the BAPS degree enhances their curriculum vitae and increases their attractiveness to potential employers. Approximately 30% of DKICP PharmD students have no prior undergraduate degree, so holding the BAPS can be vital should they seek employment in a career other than as a licensed Pharmacist.

Another perceived benefit to offering the BAPS program is its uniqueness among the other 144 Colleges of Pharmacy. There are only three similar programs that we have identified in the nation. All are similar to the DKICP BAPS program in allowing students to earn a Bachelor's degree *en route* to earning a PharmD degree.

- Eshelman School of Pharmacy - University of North Carolina
- Wegmans School of Pharmacy - St. John Fisher College
- Bill Gatton College of Pharmacy - East Tennessee State University

4.5 Summary Statement

The BAPS is a Bachelor's degree that is only available to students enrolled in the PharmD program at the DKICP. The requirements for the degree consist of 66 semester credits transferred from a U.S. accredited institution, and 67 semester credits which are earned at the DKICP. Coursework at DKICP is comprised of the first two years of didactic and experiential coursework *en route* to completing the PharmD. Students earning the BAPS degree are recognized for their accomplishments in completing a rigorous course of study, with a strong foundation in liberal arts and basic sciences, and upper division work concentrated in the essentials in the science and practice of Pharmacy. The BAPS program prepares students for educational and career opportunities in diverse areas, including Pharmacy or other healthcare-related professions, or students may continue on in research, business, or academia. Most

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students earning the BAPS continue their course of study at DKICP, leading to the PharmD degree. However, successful completion of the PharmD program is not necessary, and students may petition to receive the degree as long as the BAPS requirements have been satisfied.

Because the BAPS degree is earned concurrently with coursework leading to the PharmD, there are no additional tuition costs for our students nor heavy administrative costs. The BAPS degree is unique at UH Hilo and within the UH system, in offering students the opportunity to earn a Bachelor's-level degree in Pharmacy Studies. Data of students surveyed at the DKICP reveal that the BAPS degree has significant value in addition to holding a PharmD. BAPS students see benefit in their educational portfolios and eventual attractiveness to employers, should they seek employment in areas other than as a licensed Pharmacist, such as marketing, sales, or regulatory affairs. It also opens up additional opportunities that would not exist if they held the PharmD alone, such as allowing them to apply for other graduate or professional degree programs which require a Bachelor's degree as a prerequisite (e.g. Masters, PhD, MD or DNP programs).

In recognition of the demonstrated value, efficiency and accomplishments of the DKICP BAPS degree program at UH Hilo, we kindly request your support to grant its advancement from provisional to established status.

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APPENDICES

APPENDIX A: Catalog Description

Students earning the Bachelor of Arts in Pharmacy Studies degree (BAPS) attain broad and thorough knowledge in the liberal arts and basic sciences, as well as specialized education in the field of pharmacy, both didactic and experiential in nature. These students are well positioned to take advantage of numerous educational and career opportunities in diverse areas, including positions in pharmacy, health care, or medicine, or may continue on in research, business, and academia.

The BAPS degree also acknowledges the achievement of students who complete a minimum of four years of college education, including rigorous course work in the basic and pharmacy sciences, on their path to the Doctor of Pharmacy (PharmD) degree.

This degree is available only to students currently enrolled in the Pharm.D. program at UH Hilo DKICP.

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APPENDIX B: Program Admissions

To be eligible for admission to the PharmD program (and therefore, the BAPS program) students must meet the following minimum requirements:

Prerequisite Courses: Admission is contingent upon the successful completion of all prerequisite courses with a minimum grade of "C" (C- grades are not accepted). Students may be in the process of completing prerequisite coursework at the time of application.

International Applicants To be eligible for admission, international applicants must complete a minimum of 30 semester hours of coursework in the United States at any regionally-accredited college or university. Of the 30 required semester hours, 15 semester hours must be allocated to non-remedial science courses.

Table V. DKICP Minimum Admissions Requirements

Required Prerequisite Courses, BAPS Transferred Credit	Semester Credits	Quarter Credits
General Biology I & II for Science Majors (w/Labs)	8	12
Microbiology (w/Labs)	4	6
General Chemistry I & II for Science Majors (w/Labs)	8	12
Organic Chemistry I & II for Science Majors (w/Labs)	8	12
Human Anatomy & Physiology I & II (w/Labs)	8	12
Calculus I or Advanced Calculus	3	4.5
English (w/3 credits composition)	6	9
Humanities	6	9
World/Cultural Diversity	3	4.5
Social/Behavioral Sciences	6	9
Economics	3	4.5
Communications (w/public speaking)	3	4.5
Total Credits	66	99

PharmCAS Application: Students must apply and submit a complete application through the Pharmacy College Application Service (PharmCAS), a centralized application service to apply to multiple Pharm.D. programs offered by schools and colleges of Pharmacy. A complete application includes a personal statement, two professional letters of recommendation (electronic letters of reference are acceptable), applicable fee(s), and official transcripts from all regionally-accredited colleges and/or universities attended. Applications are accepted from mid-July through March 01.

Supplemental Application: Upon receipt of an applicant's PharmCAS application, the CoP Admissions Committee formally requests, *via* email, that the applicant complete a supplemental application, technical standards form, and residency declaration form, as well as submit a non-refundable $50.00 application fee. A due date is indicated in the email.

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Early Decision: The CoP participates in the PharmCAS Early Decision Program which is a binding option for applicants who have decided that a particular pharmacy degree program is their first choice and will matriculate upon acceptance. This program will cease after the 2020-21 cycle per ACPE's decision.

Guaranteed Admission Program: The UH Hilo-DKICP Guaranteed Admission Program is an intensive three-year scholarly program. Students who complete the Guaranteed Admission curriculum (with a minimum of 85 credits) over three years while maintaining a minimum annual GPA of 3.25 and earning a "C" or higher in all prerequisite courses, submit an Early Decision PharmCAS application and successfully interview with the DKICP will be guaranteed admission to the PharmD Program.

Table VI. DKICP Guaranteed Admission Program Requirements

(UHH) Course ID	Course Title	Credits
BIOL 171 / 171L	Biology I (w/Lab)	4
BIOL 172 / 172L	Biology II (w/Lab)	4
BIOL 275 / 275L or BIOL 375 / 375L	Microbiology (w/Lab)	4
CHEM 161 / 161L	General Chemistry I (w/Lab)	4
CHEM 162 / 162L	General Chemistry II (w/Lab)	4
CHEM 241 / 241L	Organic Chemistry I (w/Lab)	4
CHEM 242 / 242L	Organic Chemistry II (w/Lab)	4
BIOL 243 / 243L	Human Anatomy & Physiology I (w/Lab)	4
BIOL 244 / 244L	Human Anatomy & Physiology II (w/Lab)	4
MATH 241	Calculus	4
IS 201	Pre-Pharmacy Orientation	2
ENG 100 and Above	English	6
ECON 100, ECON 130 or ECON 131	Economics	3
COM 251	Communication	3
Various	Humanities	6
Various	World Cultures	3
Various	Social Sciences	6
Various	Additional 4 Science Courses + Labs	16
Total Semester Credits		85

Application Review Process: The DKICP operates on a competitive, rolling admissions process. Applicants are responsible for verifying that all necessary documents have been received by the UH Hilo Office of Student Services. The application review process begins in August each year and continues until all available seats are filled. Upon receipt of all required application components, the materials are reviewed by the DKICP Admissions Committee. Upon review, the Committee decides whether to invite the candidate for interview, place the candidate on hold for further review, or reject the application. Eligible students who are invited for interview, may either do so in person at DKICP or via teleconference, e.g. using Zoom or Skype. Interviews are conducted by two DKICP faculty or staff. DKICP conducts closed file interviews, in which the interviewers are not provided with any candidate information with the exception of the candidate's name. This process helps to remove interviewer preconceived biases based on the

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applicant's experiences, grades, test scores or personal statements. In cases of a poorly scored initial interview, a second interview will be scheduled and scored separately. Complete applications and interview scores are then reviewed by the DKICP Admissions Committee for final admission decisions. Accepted students will be notified by email and sent a signed acceptance letter in the mail.

Transfer of Credits: Students must submit a letter of request to the DKICP Academic Advisor for an official review of their transferred course work and for a BAPS degree audit to be completed. Only coursework completed at an institution accredited by a U.S. regional accreditation agency with a final letter grade of "C" or better will be considered. Complete course syllabi may be required for review by the DKICP Associate Dean for Academic Affairs to determine transfer coursework eligibility. In questionable cases, the DKICP Dean will make the final determination if coursework is acceptable for transfer and applicable to the BAPS degree. Students transferring into UH Hilo with a transferable AA degree or BA from an institution accredited by a U.S. regional accreditation agency will be exempted from the UH Hilo General Education requirements. Degrees must have been completed prior to matriculation to UH Hilo.

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APPENDIX C: BAPS Program Curriculum

To qualify for the BAPS degree, students must be admitted to and enrolled in the DKICP PharmD program with the prerequisite 66 semester credits outlined above in **Table V.** and complete four semesters (67 credits) of additional didactic and experiential coursework outlined below in **Table VII**, earning a grade of "C" or higher in each course. Although BAPS students must enroll in the PharmD program, completion of the PharmD is not necessary to earn the BAPS, as long as the student completes all BAPS degree requirements. The total coursework leading to the BAPS degree includes both the transferred prerequisite coursework (66 semester credits) plus the years 1 and 2 in the DKICP PharmD program (67 credits), making the total coursework required for BAPS degree at 133 credits.

To earn the BAPS degree, students also must meet the graduation requirements for UH Hilo, as outlined on the website: https://hilo.hawaii.edu/catalog/graduation-requirements
In addition, students must meet UH Hilo Foundation, Diversification, Structural, and Integrative Requirements of General Education, including: Written Composition; Language Arts; Quantitative Reasoning; Global and Multicultural Perspectives; Humanities; Social Sciences; and Natural Sciences. A list of all requirements is posted on the UH Hilo General Education website: https://hilo.hawaii.edu/academics/gened/

The **year-one** curriculum at DKICP is largely foundational and introduces students to the science and practice of Pharmacy. Coursework in year-one at the DKICP includes:
- Biomedical sciences (biochemistry, pathophysiology and immunology);
- Pharmaceutical sciences (pharmacology, medicinal chemistry and pharmaceutics);
- Mathematics (pharmaceutical calculations and biostatistics);
- Social/behavioral/administrative sciences (communication, culture, interprofessional education (IPE), and American Pharmacists Association (APhA) Career Pathway Evaluation Program for Pharmacy Professionals;
- Pharmacy practice (over the counter (OTC) and top-200 drugs)

During **year-two** at the DKICP, students take advanced topics, gain experience with practical skills, and learn to evaluate both clinical data and research papers. Examples of coursework in year-two at the DKICP includes:
- Pharmacotherapy of disease states (e.g. cardiovascular; gastrointestinal; genitourinary; endocrine, and infectious diseases)
- Laboratory values (patient evaluation, e.g. blood, urine analysis, and disease values)
- Pharmacokinetics (calculation, monitoring, and adjustment of medication doses)
- Drug Information and Evidence-based medicine (selection of appropriate information resources; evaluation of literature and implementation of practice guidelines)
- Advanced special topics (electives, see list below)
- Experiential courses: including a four-week (160 hour) rotation in a retail pharmacy setting

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Table VII. BAPS Curriculum Map

DKICP Year 1, Fall Semester:

(UHH) Course ID	Course Title	Credits
PHPS 501	Biochemistry - Biomolecules	2
PHPS 503	Pharmaceutical Calculations	2
PHPS 504	Pharmaceutical Immunology	3
PHPS 505	Pharmaceutics I	3
PHPS 540	Drug Action I	2
PHPP 501	Introductory Pharmacy Practice Experiential 1	1
PHPP 510	Pharmacy Self-Care I	2
PHPP 528	Pharmacy Communications and Culture	3
Total credits		18

DKICP Year 1, Spring Semester:

(UHH) Course ID	Course Title	Credits
PHPS 502	Biochemistry - Metabolism	2
PHPS 504	Pharmaceutics II	3
PHPS 509	Pathophysiology	3
PHPS 541	Drug Action II	2
PHPP 502	Introductory Pharmacy Practice Experiential 2	1
PHPP 508	Introduction to Biostatistics	2
PHPP 510	Pharmacy Self-Care II	2
Total credits		15

DKICP Year 2, Fall Semester:

(UHH) Course ID	Course Title	Credits
PHPP 506	Retail Rotation	1
PHPS 511	Pharmacokinetics	3
PHPP 503	Introductory Pharmacy Practice Experiential 3	1
PHPP 514	Evidence-Based Medicine	3
PHPP 515	Integrated Therapeutics I (IT-I)	7
PHPP 527	Drug Information	2
Total credits		17

DKICP Year 2, Spring Semester:

(UHH) Course ID	Course Title	Credits
PHPP 504	Introductory Pharmacy Practice Experiential 4	1
PHPP 516	Integrated Therapeutics II (IT-II)	7
PHPP 519	Health Care Systems	2
PHPP 520	Pharmacy Law and Ethics	3
PHPP 523	Wellness and Disease Prevention	2
PHP- ---	*Electives (2 credit hours)	2
Total credits		17

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*Sample of Available Electives

(UHH) Course ID	Course Title	Credits
PHPP 550	History of Pharmacy	2
PHPP 554	Zoonotic Diseases	1
PHPP 555	Veterinary Medicine	1
PHPP 557	Personal Finance	1
PHPP 558	Business Admin Overview	1
PHPP 560	Pharmacy Leadership	1
PHPS 553	Radioactivity in Pharmacy	1
PHPS 554	Herbal Medicines	1
PHPS 561	Drug Discovery	1
PHPS 562	Blockbuster Drugs	1
PHPS 565	Genetics and Pharmacology of Malaria	1
PHPS 569	Cancer Prevention	1
PHPS 570	Drugs from the Ocean	1

APPENDIX D. Changes Since Provisional Approval

Table VIII. List of Curricular and Programmatic Changes BAPS Since Provisional Approval by BOR in Feb, 2011

Course	Program Change (credits)	Description
PHPS 501; PHPS 502	Biochemistry-Biomolecules: Reduced from (3) to (2) credits; Biochemistry-Metabolism: Reduced from (3) to (2) credits	"Biochemistry-Biomolecules" and "Biochemistry-Metabolism: series was reduced from a total of (6) to a total of (4) credits. Some of the course content was moved to the Drug Action I-II series. Redundant material was eliminated, and the course topics were better aligned to the needs of the Pharmacy profession.
PHPS 509	Pathophysiology: Reduced from (4) to (3) credits; active learning/workshop component added	"Pathophysiology" was reduced from (4) to (3) credits. Redundant content was eliminated, and in its place, a workshop and active learning/discussion component was added.
PHPP 511	Culture & Inter-professional Health Care (2): Replaced by PHPP 528 Pharmacy Communication and Culture (3)	The original course named "Culture & Inter-professional Health Care" was increased from (2) to (3) credits, and a Pharmacy communications component added, the course was renamed "Pharmacy Communication and Culture." Students participate in simulated encounters with patients and are evaluated by their peers and course instructor.
PHPS 512	Intro to Pharmaceutical Sciences (3): Replaced by PHPS 540 Drug Action I (2) and PHPS 541 Drug Action II (2)	Topics in "Introduction to Pharmaceutical Sciences" were increased from (3) to (4) credits, divided over two semesters and renamed as "Drug Action I-II". The redesigned course now provides for a stronger foundation in Pharmaceutical Sciences and better prepares students for application this material in the subsequent curriculum.
PHPP 507	Foundation of Integrated Therapeutics and OTC Drugs (3): Replaced with PHPP 510 Pharmacy Self-Care I (2) and PHPP 511 Pharmacy Self-Care II (2)	Topics in "Foundation of Integrated Therapeutics and OTC Drugs" were expanded to better prepare students for retail Pharmacy rotations. One credit hour was added and the course divided among two semesters and renamed the "Pharmacy Self-Care I-II" series.
PHPS 591	Basic and Applied Toxicology (3): Replaced by PHPP 523 Wellness and Disease Prevention (2) and PHPP 527 Drug Information (2)	"Basic and Applied Toxicology" was moved from the second to the third year of the PharmD curriculum and was revised to become a more advanced and applied topics course. In

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		its place, the BAPS curriculum now includes two courses, which are more fundamental to Pharmacy Studies: "Drug Information" and "Wellness & Disease Prevention"
PHPP 506	Introductory Pharmacy Practice Experience 6 (1)	About 60 hours, from PHPP 501/502 was moved to new 4-week summer community pharmacy experiential rotation, providing 160 contact hours in the pharmacy practice setting
PHPP 508	Biostatistics: Reduced from (3) to (2) credits	Redundant content eliminated
PHPP or PHPS elective	Electives: Requirement reduced from (3) to (2) credits	To accommodate the changes to the curriculum, the Elective requirement for the BAPS degree was reduced from (3) to (2) credits.
	Total change in required credits for BAPS degree: none	

APPENDIX E: List of Faculty and Area of Expertise

I. Department of Pharmaceutical Sciences

Faculty	Expertise
Dianqing Sun Professor and Chair	design and synthesis of novel small molecule and natural product based anti-infective and anti-cancer agents
Shugeng Cao, PhD Associate Professor	antibiotics (antibacterial, anticancer) from natural products, including from marine and terrestrial organisms collected in Hawai'i
Leng Chee Chang, PhD Associate Professor	isolation, identification, and biological evaluation of compounds from higher plant and microbial origin
Abhijit Date, MPharm, PhD Assistant Professor	drug delivery, bioconjugate chemistry, and biology to develop nanomedicines for the prevention and/or treatment of cancer, infectious diseases, and inflammatory disorders
Daniela Guendisch, PhD Associate Professor	targeted drug therapy and diagnostic tools for central nervous system diseases (e.g. Alzheimer's disease, major depression, addiction).
Susan Jarvi, PhD Professor	host-parasite and parasite-parasite interactions and influences on transmission and virulence of infectious diseases in Hawai'i; her lab is also home to the Hawai'i Island Rat Lungworm Working Group
Dana Koomoa-Lange, PhD Associate Professor	role of proteins in the malignant progression of neuroblastoma and other types of cancers driven by myc expression (c-myc and N-myc)
Ingo Koomoa-Lange Assistant Professor	divalent cation signaling and how it promotes pathophysiological processes of pediatric cancers and drug resistance
Ghee Tan, PhD Associate Professor	development of natural product antimalarial agents

II. Department of Pharmacy Practice

Faculty	Practice Site/Expertise
Roy Goo, PharmD Associate Professor and Chair	faculty-in-residence at Hawai'i Pacific Health Wilcox Memorial Hospital (Kauai), rural health and program development with the Hawai'i Department of Health (DOH)
Julie Ann Luiz Adrian, DVM Associate Professor	veterinary topics including complicated grief, posttraumatic stress disorder and pharmacological therapy for human response to the death of pets and animals
Cherie Merabian-Sani, PharmD, BCPS, BCCCP Assistant Professor	faculty-in-residence at Oahu's Adventist Health Castle Medical Center's Intensive Care Unit. She is double boarded in Clinical Pharmacy Practice and Critical Care Pharmacy
Bryce Fukunaga, PharmD Assistant Professor	faculty-in residence as an ambulatory care clinical pharmacist at Bay Clinic in Hilo, Hawai'i
Patricia Jusczak, BS, RPh Associate Specialist	medication safety, pain management, sterile products, Joint Commission Standards for hospitals, and medication management practice standards
Chad Kawakami PharmD, BCPS, CDE Assistant Professor	faculty-in-residence at Pali Momi Medical Center on Oahu with the JABSOM Dept. of Family Medicine; boarded as a Pharmacy Specialist and a certified diabetes educator
Michelle Kim, PharmD Assistant Specialist	faculty-in-residence at the Hawai'i Island Family Health Center, with the Hawai'i Island Family Medicine Residency Program, coordination of all Introductory Pharmacy Practice Experiential (IPPE) courses
Camlyn Masuda, PharmD, BCACP, CDE Assistant Professor	faculty-in-residence as an ambulatory care clinical pharmacist JABSOM Family Medicine's Physician Center on Oahu; boarded as an ambulatory care pharmacist, certified diabetes educator
Donna Ohora, BA, MLIS Librarian (25%)	Librarian II at Edwin H. Mookini Library serving the UH Hilo and Hawai'i Community College; manages the college's pharmacy resource library and serves as drug information resource liaison for DKICP students and faculty
Jarred Prudencio, PharmD, BC-ADM Assistant Professor	faculty-in-residence at Hilo's Hawai'i Island Family Health Center, Hawai'i Island Family Medicine Residency Program, chronic disease state treatment, comprehensive medication management, and increasing medication access; double boarded in Ambulatory Care Practice and in Advanced Diabetes Management
Allen Shih, PharmD Assistant Specialist	faculty-in-residence at the Hilo Medical Center, Intensive Care Unit and also consults with the Hawai'i Island Family Practice Residency Program
Wesley Sumida, PharmD, BCPS Associate Specialist	boarded clinical pharmacy specialty faculty-in-residence as an ambulatory care clinical pharmacist at the JABSOM University Medicine Faculty Practice, Queens Punchbowl

Deborah Taira, ScD Professor	health economist whose research focuses on understanding and reducing health disparities, particularly involving Asian and Pacific Islander Americans
Sheri Tokumaru, PharmD, BCPS Associate Professor	Director of Interprofessional Education and Development; boarded as a Critical Care Pharmacy faculty-in-residence in the Neuroscience Intensive Care Unit at The Queen's Medical Center Punchbowl
Supakit Wongwiwatthananukit, PharmD, PhD Professor	pharmaceutical education, involving curriculum and course development and assessment
Aryn Meguro, PharmD Assistant Professor	faculty-in-residence at Hawai'i Pacific Health Wilcox Memorial Hospital (Kauai)
Nicole Young, PharmD Assistant Professor	boarded in Critical Care Pharmacy and is faculty-in-residence in the Neuroscience Intensive Care Unit at The Queen's Medical Center Punchbowl

III. Dean's Office

Carolyn Ma, PharmD, BCOP, CHTP Dean and Associate Professor	Board-Certified Oncology Pharmacist with interest in pharmacy/health legislation, interprofessional education and pharmacy practice management
Lara Gomez, PharmD Associate Dean for Academic Affairs, Associate Specialist	Experiential education and healthcare preceptors
Karen Pellegrin, PhD, MBA Specialist Director of Strategic Planning and Continuing Education	Rural health and big data information technology, Medicare/Medicaid reimbursements

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UNIVERSITY of HAWAI'I
MĀNOA

March 20, 2020

MEMORANDUM

To: Benjamin Asa Kudo
           Chair, Board of Regents

VIA: David Lassner
           President

VIA: Don Straney
           Vice President for Academic Planning and Policy

VIA: Michael Bruno
           Provost

VIA: Laura Lyons
           Interim Associate Vice Chancellor for Academic Affairs

From: Dean Aloysius Helminck
           College of Natural Sciences

From: Dean Brian Taylor
           School of Ocean and Earth Science and Technology

SUBJECT: REQUEST FOR ESTABLISHED STATUS FOR THE MARINE BIOLOGY
           GRADUATE PROGRAM AT THE UNIVERSITY OF HAWAI'I AT MANOA

SPECIFIC ACTION REQUESTED:

It is respectfully requested that the Board of Regents grant established status to the Marine Biology
Graduate Program (MBGP) for Ph.D. and M.S. degrees in Marine Biology; the MBGP is jointly
administered by the College of Natural Sciences (CNS) and the School of Ocean and Earth Science and
Technology (SOEST) at the University of Hawai'i at Manoa.

RECOMMENDED EFFECTIVE DATE:

July 1, 2020

ADDITIONAL COST:

None.

PURPOSE: The mission of MBGP is to nurture a world-class community of students and faculty
dedicated to innovative scientific research and education for the benefit of the participants, the state of
Hawaii, the nation, and the world. A goal of the MBGP program is to prepare students to be

research and development leaders in marine biology, conservation, and resource management with the ability to transcend disciplinary boundaries and apply leading-edge research techniques to challenging fundamental and applied problems. To this end, the program is a catalyst and a resource for shaping the future of the broad discipline of marine biology.

BACKGROUND:

CNS and SOEST have brought their faculties and facilities to this collaborative effort of co-sponsoring a graduate program in Marine Biology. This program provides Doctoral and Master's degree programs that allow graduate students to work with scientists in both units to design an individualized graduate training program that makes use of Hawaiian marine organisms and ecosystems as well as marine science expertise that resides in CNS and SOEST and in partner organizations in the University of Hawai'i, industry, non-governmental organizations, and state and federal agencies, as detailed in the attached self-study: *Marine Biology Graduate Program at the University of Hawai'i at Manoa.*

ACTION RECOMMENDED:

It is respectfully recommended that the Board of Regents grant established status to the Ph. D in Marine Biology and M. S. in Marine Biology as part of the Marine Biology Graduate Program jointly administered by the College of Natural Sciences and the School of Ocean and Earth Science and Technology at the University of Hawai'i at Manoa.

Attachment: Self-Study for Marine Biology Graduate Program at the University of Hawai'i at Manoa

cc: Executive Administrator and Secretary of the Board Kendra Oishi

Marine Biology Graduate Program

at

University of Hawai'i at Mānoa

Self-Study

March 2020

MBGP Co-Directors:
Dr. Megan Donahue (HIMB/SOEST)
Dr. Celia Smith (SLS/CNS)

This self-study is organized following the "Guidelines for Assessment of Provisional and Established Programs" E5.201 in support of the MBGP transition from provisional to established status

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Contents

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1 INTRODUCTION

1.1 The importance of Marine Biology Graduate Program.

The University of Hawai'i at Mānoa (UHM) is uniquely positioned to excel as the home for a graduate program in Marine Biology: we have an abundance of natural marine resources, the research excellence to study them, and the state-wide need for expertise in marine resource management. Situated in the Hawaiian Archipelago, home to the largest coral reef habitats in the United States, and one of the largest marine refuges in the world, we have natural laboratories for the study of marine ecosystems, marine biogeochemical processes, reef and oceanic fisheries, and human/marine interactions. This combination of access to exceptional natural resources and critical intellectual capital has led to consistently high demand by incoming graduate students for training in marine biology because of the advantages of location, the abundance of relevant research opportunities, and cutting-edge infrastructure of UHM resources.

The Marine Biology Graduate Program (MBGP) provides an environment for students to receive advanced training specifically tailored to their interests, as well as training to address the growing need, locally and globally, for technically trained scientists, managers, and policy makers who understand the processes that govern tropical marine ecosystems. Linking the considerable expertise in marine biology in the College of Natural Sciences (CNS) and the School of Ocean and Earth Sciences and Technology (SOEST), the MBGP provides advanced professional training in Hawai'i and helps to meet State and national needs for mid-level biologists and managers in both the private and public sectors; our M.S. graduates compete well for these positions. Our Ph.D. graduates are prepared to enter the expanding field of marine biology and ecosystem research in future college-level faculty positions and in professional science research positions in the government, non-profit, and private sectors. Because of the high demand for graduate training in marine biology, the societal needs for specialists in this field, the advantages of providing such training at UHM, and the unique position of Hawai'i as a coastal state and island, **we request movement from provisional to established status for the Marine Biology Graduate Program at UHM.**

1.2 Program Administration and Governance

The MBGP is administered by the deans of the College of Natural Sciences and School of Ocean and Earth Sciences and Technology, with academic oversight and management of the program provided by two co-directors, one representing each unit. All faculty in each unit, whether in academic departments or research institutes, are eligible to apply for regular faculty status in the program. There are currently three program-level faculty standing committees that develop policies to best serve the interests of students and the program: the Admissions Committee, the Curriculum Committee, and the Assessment Committee. These committees are populated by at least one member from SOEST and CNS. Three faculty is the minimum for each committee structure.

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2 ASSESSMENT OF THE PROGRAM ORGANIZATION AND OBJECTIVES.

2.1 Overview of Marine Biology Graduate Program.

The Marine Biology Graduate Program (MBGP) is an interdisciplinary program that combines relevant research and instructional units in CNS and SOEST at the University of Hawai'i at Mānoa. We are responsible for two academic degrees:
- M.S. in Marine Biology
- Ph.D. in Marine Biology

In our 2011 proposal, the MBGP objectives wers, "to train future leaders in the marine biological sciences that include fisheries, coral reef biology, marine ecological and evolutionary genetics, marine biosensory and physiological processes, and marine resource management as they relate to tropical marine life and systems." CNS and SOEST have brought their faculties and facilities to this collaborative effort, which provides Doctoral and Master's degree programs that allow graduate students to work with scientists in both units to design an individualized graduate training program that makes use of Hawaiian marine organisms and ecosystems as well as marine science expertise that reside in CNS and SOEST and in partner organizations in the University of Hawai'i, industry, non-governmental organizations, and state and federal agencies. The MBGP admits highly qualified students with a background in biological sciences and a desire to be at the forefront of research and development in marine biological sciences. Prospective students apply from around the world to join our doctoral and master's degree candidates (Table 2.1). Admission requirements are outlined on the MBGP website (http://mbiograd.manoa.hawaii.edu/admissions.html), including academic preparation:

Students admitted into the MBGP are expected to have strong undergraduate or M.S. training in biological oceanography, environmental science, marine science, marine biology, zoology, microbiology, botany, biology, or other life sciences. Applicants are expected to have strong undergraduate background in math, chemistry and/or physics. Since the beginning of our programmatic activities, we have prepared graduates for leadership and innovation in marine biological sciences by fostering their development as critical thinkers via new courses and expanded curriculum selection, interdisciplinary activities as scholars, communicators, educators, and researchers. Our students have consistently excelled in research, building cross-disciplinary committees, and they communicate their findings to many diverse audiences. Our international student enrollment averages about 11%, enrollment of students from local high schools is currently 12%, and Native Hawaiian/Pacific Islander enrollment is 7.6%. MBGP students are conducting research that is relevant to the state of Hawai'i: 7 to 9% of our students are already employed by a state or federal agency in Hawai'i when they enter the graduate program and remain employed throughout their degree program with the full support of their academic supervisors and employers.

Since its first full year of advertising in 2013, the program has generated significant interest, represented in large numbers of applications from a diversity of states and international universities (Table 2.1).For the years 2013–2019, acceptance rates averaged 16.8 % of total of 653 applicants. Our degrees pull in new students from across national and international undergraduate and graduate programs.

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Table 2.1. Numbers of applicants, students accepted, enrolled by academic year starting in 2012. Note that 2012 was a "soft start", allowing current students to transfer into the program

	2012	2013	2014	2015	2016	2017	2018	2019
Applicants	6	112	133	82	80	71	92	77
Geographic diversity. #US states: #countries	5:1	28:7	31:13	25:10	27:8	27:6	30:10	27:6
Accepted	6	22	21	12	13	8	10	18
% Accepted	100	19.6	15.8	14.6	16.3	11.3	10.9	23.4%
Enrolled PhD:MS	3:3	12:7	13:8	8:4	8:5	1:7	4:6	7:9

Students have been successful in obtaining NSF Graduate Research Fellowships, Sea Grant Trainee Fellowships, and other competitive fellowships. Additionally, the majority of our students have been supported by Graduate Research Assistantships through extramural grant funding obtained by their advisors or other faculty (~41%), Teaching Assistantships (~33%), or tuition provided by their employer or home government (~10%).

2.2 Advising and Mentoring

Faculty Advisor
MBGP students are admitted into the program under the direct mentorship of a graduate faculty advisor. It is expected that a close mentor-student relationship will develop over the course of the student's graduate education and beyond, which will include facilitation in research training, overall professional development, and career planning and placement. There are multiple locations at which students can seek advice—the faculty advisor's office, the MBGP office, and the office of each co-director (Mānoa campus and HIMB).

Advisory Committees
Advising and mentoring begins in the week before a student's first semester with the formation of an Interim Committee. The Interim Committee is composed of the student's faculty advisor and two program faculty who meet with an incoming student, evaluate that student's academic record, and identify courses to be taken in the first year. Each student is also required to meet with their advisory committee *at least* once per year. The Interim Committee serves as the student's advisory committee until the Thesis Committee (M.S.) or Dissertation Committee (Ph.D.) is assembled at the end of the second (M.S.) or third (Ph.D.) semester. A report of the annual meeting that outlines the topics covered and any recommendations of the committee is submitted to the program coordinator by the advisor.

Annual Progress Report
Students submit an annual progress report that outlines their accomplishments for the previous academic year, plans for the upcoming year, and their near-term career goals. The advisor reviews the report and completes a rubric to assess the student's academic progress. If progress is considered unsatisfactory, a meeting with the student and committee will be scheduled to determine a plan of action to bring the student up to an acceptable standard.

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2.3 The Ph.D. in Marine Biology

The Ph.D. is the highest degree awarded by universities in the United States and thus represents the pinnacle of academic achievement. The Ph.D. in Marine Biology is designed to scientifically train leaders who identify, investigate, and solve problems related with marine biological resources and responses of marine organisms and coastal ecosystem processes to a globally changing ocean.

Coursework

The Ph.D. in Marine Biology requires all students to attend and pass a two-semester course focused on professional development and critical reading of literature (MBIO 603 & 604, 1 credit each) as a cohort experience. For students without a prior M.S., two courses from an approved list (see Appendix A – Marine Biology Curriculum Requirements) and one graduate level course in statistics are required. This approved list of courses is updated regularly to reflect course availability, developments in the field, and faculty expertise. A total of 18 credits of coursework is required for the Ph.D. with no prior M.S., and remaining credits can be earned from a mix of graduate level courses recommended by their advisor and permanent committee.

Table 2.2. Courses developed and offered under the heading. MBIO

MBIO 603	Career Skills for Marine Biologists	1 cr
MBIO 604	Current Research in Marine Biology	1 cr
MBIO 611	Introduction to Quantitative Methods in Fisheries Science	4 cr
MBIO 691x	Seminars in Marine Biology	1 cr
MBIO 710	Topics in Marine Fisheries & Natural Resource Management	1-4 cr
MBIO 715	Marine Conservation Ecology	1-3 cr
MBIO 720	Topics in Marine Education, Outreach, and Policy	1-4 cr
MBIO 725	Topics in Marine Physiology, Behavior, & Organismal Biology	1-4 cr
MBIO 740	Advanced Topics in Quantitative Biology	2-4 cr

Table 2.3. Other courses also accepted towards formal coursework for MBIO degrees

BOT 682 & 682L	Plants in Marine Environments	3 + 1 cr
OCN 626	Marine Microplankton Ecology	4 cr
OCN 627	Ecology of Pelagic Marine Animals	4 cr
OCN 628	Benthic Biological Oceanography	4 cr
OCN 630	Deep Sea Biology	3 cr
ZOO 780/781	Foundations of Evolution and Ecology	4 + 4* cr

*only 4 credits of ZOO 780/781 can count toward the degree

Table 2.5. Courses, Sections, SSH

COURSES, SECTIONS, SSH (Annual)	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
MBIO Courses Offered	8	17	14	23	15	18
Annual SSH	294	550	500	584	496	595

Science Communication & Teaching

The Marine Biology Graduate Faculty also considers experience in science communication and teaching as an integral part of the academic training program, and both are required of all

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doctoral students. Teaching experience usually takes the form of a teaching assistantship for at least one semester but may also be fulfilled by experience in teaching high school biology, teaching of professional workshops, or other teaching experience. Science communication in the form of one presentation at a scientific conference or public event is required annually of all students.

2.4 The M.S. in Marine Biology

The Masters of Science (Plan A only) is the intermediate degree awarded by universities in the United States and thus represents a significant step above undergraduate education and skill while not fully attaining the academic achievement of a Ph.D. In the M.S. program, students are challenged to demonstrate that they understand what is involved in research, typically in a single research chapter. Thus, the M.S. is designed to scientifically train resource managers, agency scientists, and rising research leaders who, with more experience, will be able to identify, investigate, and solve complex problems related to the biology of marine organisms and coastal resources. While some holding M.S. degrees may continue on to a Ph.D., many will select career paths in teaching, community advocacy, or resource management policy.

2.5 Demonstration of core competencies

Diverse curricular pathways and activities allow students to learn and demonstrate core competencies in marine biological sciences. Our multi-step process of demonstrating core competencies, including formative assessment and mentoring, coursework, preparation of a research proposal, proposal defense, and final presentation and defense, when combined with our graduate curriculum and research areas, creates an effective and efficient program for students to achieve their individualized goals through of academic scholarship, research productivity, and publications of their findings. Our program is thus organized in such a way as to meet its objective to *train future leaders in the marine biological sciences.*

3 ASSESSMENT OF PROGRAM RESOURCES

3.1 Faculty resources

The MBGP faculty is a large, diverse and well qualified group. As an interdepartmental program, there are no faculty lines dedicated to the MBGP. As we re-envision the core curriculum of the MBGP (see The Future of the MBGP, Re-envisioning a Core Curriculum), we look forward to the support of the SOEST and CNS Deans as we leverage the instructional capacity of recent hires at SOEST/HIMB and imminent hires in CNS/SLS. Our full faculty includes regular and cooperating faculty as defined by Graduate Division, as well as affiliate faculty from partner institutions. Approximately 75% of our regular or cooperating faculty have served as advisors for MBGP students, and 75% have contributed to teaching MBGP courses. Our 42 regular and cooperating faculty are housed in four units of SOEST: the Oceanography Department (10 faculty), Hawai'i Institute of Marine Biology (14 faculty), Pacific Biosciences Research Center (2 faculty) and Earth Sciences (1 faculty). In CNS, the newly established School of Life Sciences combines faculty previously housed in Botany (3 faculty), Microbiology (1 faculty) and Zoology (8 faculty) (**Error! Reference source not found.**). Additionally, three MBGP faculty are in units on Hawai'i Island, either at UH Hilo (2) or the USGS Cooperative Unit, in Hilo (1).

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3.2 Affiliate Faculty as Resources for our Students.

Hawaiʻi serves as headquarters for numerous marine agencies, providing MBGP with a rich pool of highly qualified Affiliate Faculty. These Affiliate Faculty join us from the federal and state agencies, non-governmental organizations, and faculty affiliates of HIMB. Federal agencies represent the greatest proportion with 10 faculty from NOAA, USFWS, USGS. Many of these colleagues contribute to student development through service on student advisory committees and participation in core courses and seminars as guest speakers.

3.3 Program resources

We have stayed within the originally defined parameters for new resources detailed in our original proposal. Additional courses required by the both programs have been taught by existing faculty, as planned. The Program Coordinator (hired in 2019) was likewise funded through a reallocation of internal funds. We had anticipated enrollments to require 3 to 5 new positions, and indeed 3 have since been hired, one in 2018, 2019, and 2020. The total expenses for the program were estimated at $65,000 to $75,000 per year, and in actuality those expenses have averaged $69,000. We have exceeded our original revenue projections based on increasing enrollments, and our graduate students have successfully sought and received foundation and extramural support for the training.

Operating Budget
The program receives an operating budget of $4,000 from each dean for office supplies, course support, and program events. In 2012, CNS added a one-time purchase of the program's office equipment, four iMacs for student and class use, and six microscopes. In 2018, SOEST provided funds for refurbishing the HIG 132 class/meeting space.

Space
The MBGP program offices occupy two rooms (HIG 131a, 132) provided by SOEST on the first floor of the Hawaiʻi Institute for Geophysics (HIG) Building. HIG 131a serves as office space for the Program Coordinator and small meeting space. HIG 132 is a conference room used for committee meetings and seminar classes. SOEST also identified space in the Marine Sciences Building (MSB) for graduate student office space. This graduate student office space is particularly critical for first-year students, who may be on campus full-time for coursework but whose faculty advisor and laboratory is off-campus.

Program Coordinator:
Our full-time Program Coordinator (PC)is essential to the success of the MBGP. The PC performs the day to day administration of the program, including the processing of applications, tracking of student progress, coordination of fall welcome activities, scheduling of classes and seminars, and regular meetings and assigned tasks from the Co-Directors. The PC's salary is supported by equal contributions of $30,000 from the SOEST and CNS Deans

Teaching Assistantships
In 2015, the Vice Chancellor for Academic Affairs allocated four teaching assistantships to the MBGP through the College of Natural Sciences to support MBGP graduate students and teach in classes that serve the B.S. in Marine Biology. Starting in Fall 2015, MBGP has used these four teaching assistantships as recruitment incentives for top-ranking graduate applicants. Beyond these four teaching assistantships specifically allocated to the MBGP, our students are recruited

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as teaching assistants to support courses across campus, typically in the CNS School of Life Sciences or, less frequently, in the SOEST Department of Oceanography or other departments.

Co-Directors

Each of the MBGP Co-Directors receive summary salary (for 9-mos 1.0 FTE I-faculty) or its equivalent (for 11-mos 0.85 FTE R-faculty) to support their leadership of the program.

3.4 Assessment of program efficiency

As originally proposed, the MBGP has not had new faculty lines to support the program. Our academic offerings include specific new courses with MBIO designations, including the core 603 and 604 professional development courses. However, most of our students' class credits come from leveraging existing courses in Biology, Botany, Microbiology, Oceanography, and Zoology. Thus, this new graduate program is exceptionally cost effective in training. Also, all MBGP faculty have a locus of tenure within another unit; therefore, there are no additional faculty costs associated with the MBIO program.

3.5 Efficiency with respect to M.S. and Ph.D. numbers and graduation rates

A second way to evaluate efficiency of our program is through review of the number of Ph.D. students and our graduation rate. The Marine Biology Graduate Program matriculated its first cohort in FY13, and, as of Fall 2019, we have 71 students (27 MS, 44 PhD) in the program (**Error! Reference source not found.**). Our program enrollment now exceeds that of related but more established programs on campus (

Table 3.1). We graduated our first PhD students in AY 16–17, on time for a 5-year degree program, and 10 PhDs in Marine Biology have been granted in the past three years with 6 anticipated in the current academic year. MBGP graduation has kept pace with student enrollment (**Error! Reference source not found.**) and is comparable to graduation rates of more established programs on campus (Table 3.2).

Table 3.1. Graduate students enrolled in MBGP compared to other units

Year	MBGP		Botany		Microbiology		Oceanography		Zoology	
	MS	PhD	MS	PhD	MS	PhD	MS	PhD	MS	PhD
Fall 2012	5	1	14	26	14	17	14	48	30	58
Fall 2013	12	15	11	24	11	14	7	48	26	56
Fall 2014	21	28	10	25	9	7	9	45	17	55
Fall 2015	22	35	11	23	5	13	13	40	12	52
Fall 2016	15	43	14	21	7	10	17	28	12	35
Fall 2017	18	42	17	20	3	8	12	24	9	29
Fall 2018	25	44	13	18	4	8	15	26	8	27
Fall 2019	27	44	–	–	–	–	–	–	–	–
Avg y^{-1}	18.1	31.5	12.9	22.4	7.6	11	12.4	37	16.3	44.6

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Table 3.2. Degrees awarded in MBGP compared to other relevant units (* includes projected graduates for Spring 2020)

Year	MBGP		Botany		Microbiology		Oceanography		Zoology	
	MS	PhD	MS	PhD	MS	PhD	MS	PhD	MS	PhD
2012–2013	0	0	4	2	5	4	7	4	11	7
2013–2014	0	0	5	7	2	6	5	5	9	2
2014–2015	2	0	4	3	2	1	3	5	12	9
2015–2016	11	0	3	1	2	3	4	9	11	13
2016–2017	5	2	1	3	3	3	6	6	4	11
2017–2018	4	1	9	2	3	2	4	3	4	9
2018–2019	4	7	7	2	0	1	2	6	4	4
2019–2020	6*	6*	–	–	–	–	–	–	–	–
Awards y^{-1}	5.3*	4*	4.7	2.9	2.4	2.9	4.4	5.4	7.9	7.9

3.6 Time to degree

Nationally, time to degree for PhD from start of grad school for Life Sciences is 6.9 yrs for women and 6.7 yrs for men. We compare quite favorably with this national mean: our median time to degree for Ph.D. in Marine Biology is 5.6. For our M.S. students, median time to degree is 3 years.

3.7 Interdepartmental Synergies across the MBGP

Our program has grown quickly over five years in part because of the place-based, excellent education it delivers. This novel hybrid has leaders in their fields who now collaborate in ways that set new standards for training students as marine biologists. Approximately 43% of student advisory committees include both CNS and SOEST faculty members (not including university representatives). This trend seems to be increasing—for example, 33.3% of M.S. student committees included members from both units between 2012–2014, compared to 57.1% of M.S. student committees between 2015–2018. In effect, this program appears to have re-united old partners: Oceanography was moved from CNS to SOEST in 1988 by President Al Simone. The accumulated strengths of the now 30-year old SOEST combined with core strengths of marine biologists in CNS has delivered an even stronger program now with federal, state and NGO partners as affiliate faculty. We have raised the quality of education for marine biologists overall. The success of the MBGP is clear.

4 ASSESSMENT OF STUDENT LEARNING AND STUDENT AND PROGRAM SUCCESS.

4.1 Description of student learning objectives

The MBGP graduate program provides courses and individualized training for advanced research in Marine Biology. Our objective is to help students achieve a high level of professional competence and lifelong learning, with the following Student Learning Objectives (SLOs), all of which are shared between our M.S. and Ph.D. degree programs.

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SLO 1 – A working, in-depth understanding of marine biological systems and processes in both offshore and near shore environments, with an emphasis on the important linkages between these habitats.

SLO 2 – Demonstrated expertise in quantitative and qualitative methods for field and laboratory research with the ability to develop a comprehensive research plan.

SLO 3 – Advanced competency in publishing, disseminating, and communicating research findings in professional and practical applications and in grant writing.

The basic structure of our program has been designed to ensure that successful graduates have satisfactorily achieved all learning objectives. Appendix B provides an example of possible roadmaps to degree for M.S. and Ph.D. students (7.2   Appendix B. Possible Roadmaps for M.S. and Ph.D. Degrees).

4.2   Faculty honors and recognition

The MBGP has an emerging national and international reputation, and our faculty are regularly awarded grants, fellowships, awards, contracts, and commissions They also maintain active scholarship, with a publication record of ~3.5 papers per person per year. This active scholarship and substantial funding allow our students to engage in well-supported and cutting edge fundamental and applied research in marine biology. The MBGP faculty are highly distinguished professionals in their respective fields. In addition to their impressive funding and publication records, they are also well-recognized by their peers. Below is a selection of academic awards, recognition and honors that have been bestowed upon MBGP faculty.

- A.G. Huntsman Medal for Excellence in Marine Science
- Aldo Leopold Leadership Program Fellow (2)
- American Academy of Arts and Sciences Elected Fellow
- American Academy of Microbiology Elected Fellow
- American Association for the Advancement of Science Elected Fellow
- ARCS Foundation Scientists of the Year
- Dr. Suzanne Lawrenz-Miller (CA) Education Award
- Editor in Chief, Journal of Experimental Marine Biology and Ecology
- European Association for Geochemistry elected fellow
- Executive appointee to the Marine Protected Areas Federal Advisory Committee
- Fellow of the International Society for Reef Studies
- Frolich Fellow CSIRO Marine Laboratories, Hobart, Australia
- Fulbright Senior Scholar
- Geochemical Society Elected Fellow
- International Society for Reef Studies Elected Fellow
- Klaus Wyrtki Graduate Teaching Excellence Award
- Kobe Award (Japan) for Lifetime Achievement in Aquatic Biology
- Member of the IUCN Cetacean Specialist Group
- Member, Invasive Species Advisory Committee, (ISAC), FACA panel, US DOI
- Member, Ocean Research Advisory Panel (ORAP), FACA panel, Sec of the Navy
- Nominated for UHM Excellence in Research Award
- Oahu Surfrider Foundation, John Kelly Lifetime Achievement Award
- Paul G. Allen Ocean Challenge Prize
- Peter V. Garrod Distinguished Graduate Mentorship Award
- Pew Fellowship in Marine Conservation (2)

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- President, American Academy of Underwater Sciences
- Rank Prize Fund, Young Investigator Award
- Science Advisor to Annual Hana Limu Festival
- Senckenberg Prize in Nature Research, Frankfurt, Germany
- Sidney and Erica Hsiao Endowed Chair in Marine Biology
- U.S. Coral Reef Task Force "Outstanding Scientific Advancement of Knowledge"
- U.S. Geological Survey Outstanding Fisheries Research Excellence award
- UH Board of Regents Excellence in Research Award (2)
- UH Chancellor's Citation for Meritorious Teaching
- UH Mānoa Center for Teaching Excellence Affiliate Faculty (2)
- UH President's Emerging Leader (2)

4.3 Student honors and recognition

Our students are similarly impressive. Below is a sample of other academic and research honors bestowed upon MBGP students since 2013.

- AAUS Foundation Kathy Johnston English Scholarship
- Albert L. Tester Symposium Best 5 -Minute Presentation (4)
- Albert L. Tester Symposium Best Graduate Poster
- Albert L. Tester Symposium Best Paper (6)
- Bill Raynor Micronesia Challenge Scholarship
- Carol Ann & Myron K. Hayashida Scholarship
- Charles H. and Margaret B. Edmondson Research Award (2)
- Colonel Willys E. Lord, DVM & Sandina L. Lord Endowed Scholarship (8)
- Conchologists of America Research Grant
- COSEE Graduate Fellowship
- Denise B. Evans Fellowship in Oceanographic Research (2)
- EPA STAR Fellowship
- Fernando Gabriel Leonida Memorial Scholarship
- Frances Davis Award for Excellence in Undergraduate Teaching Nomination (4)
- Hauʻoli Mau Loa Graduate Fellowship (4)
- Hawaiʻi Conservation Conference Best Student Paper
- IUCN and UH East-West Center Eco Steward Award
- John A. Knauss Marine Policy Fellowship
- Lerner-Gray Memorial Fund from the American Museum of Natural History
- Natural Sciences and Engineering Research Council of Canada Scholarship
- NSF Graduate Research Fellowship (13)
- NSF GRFP Honorable Mention
- Philanthropic Education Organization Scholar Award
- Pohnpei Rotary Club Scholarship
- Sagarin Innovative Ecology Fund
- Smithsonian Fellowship
- UH Mānoa EECB Yoshimoto Scholarship
- UH Mānoa Opportunity Grant (2)
- UH Office of Graduate Education Dean's Achievement Scholarship (2)
- UH Renee Heyum Scholarship

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4.4 Student Exit Surveys

Eighty percent of our graduates who completed the exit survey indicated they are continuing their graduate education or have existing employment plans upon graduation. According the exit survey findings, MBGP is perceived as a supportive science environment for students.

5 ASSESSMENT OF APPROPRIATENESS OF PROGRAM OUTCOMES

5.1 Alignment with UH Strategic Priorities

UH Mānoa Strategic Investment Initiatives
Five MBGP faculty are represented in three of the recently funded Mānoa Strategic Investment Initiatives, demonstrating both excellence and a high degree of cross-disciplinary collaboration in their research. Each of these programs, "Engaging Sustainability and Resilience of Island Ecosystems, Stewardship and Indigenous Sciences: Enhancing Student, Faculty and Community Capacity", "Microbiomes of Hawaiian Ahupua'a Watersheds", and "SMART Alawai", address critical current and emerging environmental issues in the state of Hawai'i. They will no doubt also have a positive impact on the interdisciplinary training and professional development of the MBIO graduate students involved in these projects.

UH System Strategic Directives
The MBGP objectives and outcomes align well with two of the UH Strategic Directives: *Hawai'i Innovation Initiative*, and the *High Performance Mission Driven System*.

Hawai'i Innovation Initiative (HI2)
- MBGP faculty are highly productive and successful scientists who are applying advanced research technologies to conduct critical research related to marine ecosystem health, ocean and coastal tourism, climate change, endangered species, resource management, and biogeochemistry in Hawai'i as a microcosm for global challenges.
- The MBGP has many collaborative relationships with affiliates in state, national and non-governmental agencies, as demonstrated by our robust affiliate faculty roster, all of whom contribute to the program in some meaningful way, either through mentoring, guest lecturing, or committee service.
- We have also reached out to other organizations as partners on two NSF proposals for enhancing non-academic training opportunities for our graduate students. These proposals have not been funded, but we continue to converse with these collaborators and will be submitting additional funding proposals in the future.
- The MBGP clearly leverages our island location and exceptional UH expertise in ocean and climate sciences.

High Performance Mission-Driven System (HPMS)
- The MBGP leverages both human and facilities resources by bringing together existing faculty in the SOEST and CNS to deliver targeted graduate training in biological, ecological, and evolutionary processes in ocean ecosystems. With approximately 100 applicants per year, a graduate program in marine biology is clearly desirable and filling a need for competitive students interested in a formal

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degree pathway. The program includes graduate faculty at UH Hilo as well, providing opportunities for those faculty to mentor Ph.D. level students.

- The MBGP introduces our new students to the program using a cohort model for the first academic year by requiring all students entering the program to take the career skills course (MBIO 603) and research topics seminar course (MBIO 604), which help prepare them with grant writing, ethics, publication, cultural awareness, teaching, communication, literature review, and critical analysis skills that will be important for both graduate school and professional life.

5.2 Alignment with the State of Hawaiʻi

The MBGP has the promise to provide highly trained science professionals that align the state's needs and political priorities. Indeed, our students and faculty work closely with the state on the following specific management issues and areas.

30 by 30
On September 1, 2016, Governor Ige announced the State's commitment to effectively manage 30% of Hawaiʻi's nearshore waters by 2030. The current goals are to improve the capacity and coverage of enforcement, support community-based marine management, develop a plan to address coral bleaching, and strengthen statewide regulations, monitoring, and other adaptive management measures. The purpose is to balance sustainable use with restoration and conservation, such as with fisheries so that our communities can benefit now and in the future.

Combating Coral Bleaching
In February 2017, Governor Ige spoke at the 37th U.S. Coral Reef Task Force meeting at the National Governors Association Conference. Coral reefs are living treasures with cultural, economic, and ecological significance and value. Unfortunately, coral bleaching has become a major problem as a result of rising sea surface temperatures and human activity. Unprecedented levels of coral bleaching across Hawaiʻi prompted a response from state and federal agencies and volunteer organizations. To combat the harmful results of pollution on coral reef health, the U.S. Coast Guard, NOAA, the Department of the Interior, and the State of Hawaiʻi conducted large-scale marine debris removal efforts in the Northwestern Hawaiian Islands. State marine biologists and the DLNR Division of Aquatic Resources are investigating best practices and methods being used around the world to apply toward coral recovery.

State & Federal Designation of Heʻeia NERR
In August 2017, a formal partnership between NOAA and the State of Hawaiʻi established the Heʻeia National Estuarine Research Reserve as the newest member of NOAA's Reserve System. Its 1,385 acres include the estuary of the ahupuaʻa of Heʻeia on Kāneʻohe Bay and Moku o Loʻe, the location of Hawaiʻi Institute of Marine Biology. HeNERR is also designated a NOAA Sentinel Site, bringing together science, management, and technology to address the impacts of sea level changes on coastal communities (https://oceanservice.noaa.gov/sentinelsites/).

6 THE FUTURE OF THE MBGP

We believe that this self-study demonstrates the success of the vision that began this program in 2012: *to train future leaders in the marine biological sciences.* Our program has grown to a steady population of ~65 students, graduating ~10 students a year. As promised, our program has

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become an example of a successful interdisciplinary program: a dynamic campus hub integrating faculty from across campus into new collaborative relationships with MBGP students at the center. While we anticipate that the MBGP will achieve established status, we are still moving forward to improve the program.

- **Re-envisioning a Core Curriculum**

We would like to reinstate a core content course in marine biology and ecology of Hawaiian ecosystems for our first-year cohort students, and to initiate more place-based education to study our remarkable natural resources while creating a comfortable fit for students with our native culture. The Hawaiian marine environment draws many students, but it is a particularly important path for Native Hawaiian students to thrive in science. We look forward to training our students in science training that respects and incorporates Hawaiian place-based teaching and research and will engage students and lead to their success.

- **Data Science for Marine Biologists**

Hawai'i Data Science Initiative (HI-DSI) is developing a new Data Science certificate program. Data science skills, including data wrangling, scripting, coding, statistics, and machine learning, are absolutely critical to the future career success of our students. We are working with HI-DSI to develop a Data Science for Marine Biologists track in the certificate program.

- **New avenues of feedback for program improvement**

The MBGP is joining a SOEST-wide initiative to expand the annual graduate student review process. The process will shift from the evaluation of student performance to an opportunity for feedback – in both directions – between each student, their academic mentor and committee, and the program.

- **Funding for Recruitment**

The high expense of travel to Hawai'i means that most of our applicants do not have an opportunity to visit the campus and interview with potential faculty mentors in person during the application process. Likewise, as a program we do not have a chance to showcase our excellent research facilities and resources to top student candidates. We are working to resource a small recruitment fund to bring the top 3-4 MBGP student candidates for a tour of MBGP research facilities and in-person interviews with faculty, postdocs, and other students.

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7.   APPENDICES

7.1   Appendix A. Marine Biology Curriculum Requirements

M.S. Plan A	Ph.D. without prior M.S.
A minimum of 30 credits with a grade of B, or better, maintaining a GPA of at least 3.0	A minimum of 30 credits with a grade of B, or better, maintaining a GPA of at least 3.0
At least 18 credits of coursework (14 credits of formal courses and up to 4 credits of 1 unit seminar courses) and 6 credits of Research (699) and 6 credits of Thesis (700). Must be enrolled in MBIO 700 the semester of graduation.	At least 18 credits of coursework (14 credits of formal courses and up to 4 credits of 1 unit seminar courses) and 6 to 12 credits of Research (699) or Dissertation (800). Must be enrolled in MBIO 800 the semester of graduation.
Course Requirements	
A. Required of all students	**A. Required of all students**
• MBIO 603 Professional Development for Marine Biologists (1) • MBIO 604 Introduction to MBGP Faculty (1)	• MBIO 603 Professional Development for Marine Biologists (1) • MBIO 604 Introduction to MBGP Faculty (1)
B. TWO of the following list are required prior to graduation: • MBIO 611 Introduction to Quantitative Methods in Fisheries Science (4) • MBIO 715 Marine Conservation Ecology (1-3) • MBIO 710 Topics in Marine Fisheries and Natural Resource Management (1-4) - approval by petition • MBIO 725 Topics in Marine Physiology, Behavior, and Organismal Biology (1-4) - approval on a case-by-case basis by petition • MBIO 740 Advanced Topics in Quantitative Biology (3-4) - approval by petition • OCN 626 Marine Microplankton Ecology (4) • OCN 627 Ecology of Pelagic Marine Animals (4) • OCN 628 Benthic Biological Oceanography (4) • OCN 630 Deep Sea Biology (3)	**B. TWO of the following list are required prior to graduation:** • MBIO 611 Introduction to Quantitative Methods in Fisheries Science (4) • MBIO 715 Marine Conservation Ecology (1-3) • MBIO 710 Topics in Marine Fisheries and Natural Resource Management (1-4) - approval by petition • MBIO 725 Topics in Marine Physiology, Behavior, and Organismal Biology (1-4) - approval on a case-by-case basis by petition • MBIO 740 Advanced Topics in Quantitative Biology (3-4) - approval by petition • OCN 626 Marine Microplankton Ecology (4) • OCN 627 Ecology of Pelagic Marine Animals (4) • OCN 628 Benthic Biological Oceanography (4) • OCN 630 Deep Sea Biology (3)

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• BOT 682 (3) & 682L (1) - Plants in Marine Environments (4 total) – to be taken concurrently • ZOOL 780/781 (8) Foundations of Evolution and Ecology - must be taken together but will count as credit toward one MBIO content course	• BOT 682 (3) & 682L (1) - Plants in Marine Environments (4 total) – to be taken concurrently • ZOOL 780/781 (8) Foundations of Evolution and Ecology - must be taken together but will count as credit toward one MBIO content course
C. One of the following two courses in statistics is required prior to graduation: • ZOOL 631 Biometry (4) • OCN 682 Intro to Programming & Stats in R (3) Other courses in statistics may be substituted at the discretion of the student's committee	**C. One of the following two courses in statistics is required prior to graduation:** • ZOOL 631 Biometry (4) • OCN 682 Intro to Programming and Stats in R (3) Other courses in statistics may be substituted at the discretion of the student's committee
Students entering the Ph.D. program with a M.S. (or equivalent) in the life sciences must:	
• Complete courses specified above in part (A) (MBIO 603 & 604) • Complete courses prescribed by the student's Interim or Dissertation • Enroll in MBIO 800 (dissertation)	

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7.2   Appendix B. Possible Roadmaps for M.S. and Ph.D. Degrees

<u>M.S. Roadmap for MBIO</u>

Year 1		Year 2		Year 3	
Fall		Fall		Fall	
MBIO 603	1	MBIO 691(alpha) seminar	1	MBIO700	1
Biometry	4	Disciplinary Core Course	3		
MBIO 691B Seminar	1	MBIO 699	4		
Disciplinary Core Course	4				
Credits	10	Credits	8	Credits	1
Spring		Spring		Spring	
MBIO 604	1	MBIO 691(alpha) seminar	1	MBIO 700	1
Statistics in R	3	Disciplinary elective	3		
MBIO 691B Seminar	1	MBIO 699	4		
Disciplinary Core Course	3				
Credits	8	Credits	8	Credits	1
TOTAL CREDITS	18	TOTAL CREDITS	16	TOTAL CREDITS	2

PROGRAM TOTAL   36

<u>Ph.D. Roadmap for MBIO</u>

Fall		Fall		Fall		Fall		Fall	
MBIO 603	1	MBIO 691x seminar	1	Elective seminar	1	MBIO 800	1	MBIO 800	1
Biometry	4	Disciplinary Core Course	3	Disciplinary elective	3				
MBIO 691B sem.	1	MBIO 699	4	MBIO 699	4				
Disciplinary Core Course	4								
Credits	10	Credits	8	Credits	8	Credits	1	Credits	1
Spring		Spring		Spring		Spring		Spring	
MBIO 604	1	MBIO 691x seminar	1	MBIO 699	8	MBIO 800	1	MBIO 800	1
Statistics in R	3	Disciplinary elective	3						
MBIO 691B sem.	1	MBIO 699	4						
Disciplinary Core Course	3								
Credits	8	Credits	8	Credits	8	Credits	1	Credits	1
Tot Credits	18	Tot Credits	16	Tot Credits	16	Tot Credits 2		Tot Credits	2

PROGRAM TOTAL   54

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UNIVERSITY OF HAWAI'I
of HAWAI'I·
WEST O'AHU

April 21, 2020

MEMORANDUM

TO: Benjamin Kudo
Chair, Board of Regents

VIA: David Lassner
President

VIA: Donald Straney
Vice President for Academic Planning and Policy

FROM: Maenette Benham,
Chancellor

SUBJECT: Request Approval of a New Provisional Degree, Bachelor of Science in
Cybersecurity

SPECIFIC ACTION REQUESTED:

It is requested that the Board of Regents approve a new provisional degree, the Bachelor of
Science in Cybersecurity (BS-CYBR), at the University of Hawai'i—West O'ahu.

RECOMMENDED EFFECTIVE DATE:

Fall 2020

ADDITIONAL COST:

There are additional costs associated with this request. Increased projected enrollment will
require additional personnel.

PURPOSE:

With our increased reliance on information technology systems and cyber work environments across all industries, there is an urgent need for highly skilled cybersecurity professionals. The proposed Bachelor of Science in Cybersecurity (BS-CYBR) will address this demand by providing students with a pathway to acquire specialized knowledge and skills required to meet this growing need. It will be UH West Oʻahu's second STEM degree program. The BS-CYBR's highly technical cybersecurity program designed to provide students with an advanced cybersecurity education will expand students' knowledge of information security, mathematics, computer science, and computer engineering. It will also prepare them to meet the leading cybersecurity workforce requirements of public sector agencies and private sector enterprises. Employers with advanced cybersecurity requirements who hire BS-CYBR graduates with these skills, can be confident in their ability to identify, protect, detect, respond, and recover from cybersecurity threats.

BACKGROUND:

Board of Regents Policy 5.201: Instructional Programs states that "The board shall approve the establishment of all new instructional programs granting academic credit leading to a degree or credential, upon recommendation by the president."

The proposed Bachelor of Science in Cybersecurity (BS-CYBR) degree fulfills the charge of the UH System's Integrated Academic and Facilities Plan (IAFP) calling for the addition of one or more baccalaureate STEM degree programs at the University of Hawaiʻi—West Oʻahu. Additionally, it meets a key sector need for Hawaiʻi's post-COVID-19 economic revitalization. The BS-CYBR builds on the success of our current Information Security & Assurance concentration under the Bachelor of Applied Science degree program. The proposed program is also consistent with the institution's Strategic Action Plan, 2018-2028, which explicitly articulates UH West Oʻahu's commitment to supporting the greater community and fueling state economic growth by developing "innovative and transformative thinkers with the ability to generate and apply knowledge to address the pressing issues of our times" (page 7). The proposed degree also aligns with UH West Oʻahu's designated applied and technical focus as defined by the IAFP and meets the UH System IAFP call for UH West Oʻahu to focus on general degrees that are distinctive, and for degrees that will articulate well with our UH Community Colleges. In accordance with the IAFP, this degree is also attentive to community college transfer students.

The BS-CYBR Program was developed in accordance with the standards consistent with earning the designation of being a National Security Agency (NSA)/Department of Homeland Security (DHS) Center of Excellence in Cyber Operations Fundamentals. A Center of Academic

Excellence Cyber Operations program would complement the following existing Centers of Academic Excellence in Cyber Defense programs already present in our UH System: Cyber Defense Research (UHM), Cyber Defense 2-Year Education (HonCC and LeeCC), and Cyber Defense Education (UH West Oʻahu and Maui College). It would provide a particular emphasis on technologies and techniques related to specialized cyber operations (e.g., collection, investigation, and response). These technologies and techniques are critical to intelligence, military, and law enforcement organizations authorized to perform these specialized operations.

The proposed BS-CYBR should be created at UH West Oʻahu as the next step in the progression to develop a complementary, select STEM program that is integrated with the already existing and highly successful Bachelor of Applied Science, Information Security & Assurance (BAS-ISA). Our campus currently employs the faculty expertise to carry out and support this next step. While the numbers of students in the BAS-ISA are expected to continue on a positive trajectory, the faculty expects that the BS-CYBR will attract students from the BAS-ISA who wish to move beyond cyber protection and defense into the realm of cyber analysis, collection, operation, and investigations. The shared BAS-ISA and the BS-CYBR pathway at the foundational lower-division course level diverges at the upper division level. Overall, both cyber programs are expected to grow together and complement each other. Our faculty and Institutional Research Office project 34 BS-CYBR students in the first year, averaging 65 students a year over five years, with 81 students in 2025.

The proposed BS-CYBR exemplifies the development of a successful area of concentration that fulfills the mission of UH West Oʻahu as highlighted in the IAFP. That mission is to offer students a distinct learning experience focused on 21st century skills that prepares them to be innovative community leaders. In particular, the IAFP identifies signature programs that include "creative media, cybersecurity, facilities management, sustainable community food systems and insurance" (p. 8). This new Bachelor of Science in Cybersecurity degree will fulfill the promise of our mission and will be crucial to timely meeting a critical workforce demand.

ACTION RECOMMENDED:

It is recommended that the Board of Regents approve a new provisional degree, the Bachelor of Science in Cybersecurity, at the University of Hawaiʻi—West Oʻahu.

Attachment

c: Kendra Oishi, Executive Administrator and Secretary to the Board of Regents
       Jeffrey Moniz, Vice Chancellor for Academic Affairs

UNIVERSITY *of* HAWAI'I·
WEST O'AHU

Program Proposal
Bachelor of Science in Cybersecurity

Table of Contents

Program Purpose

A new degree program, a Bachelor of Science in Cybersecurity (BS-CYBR), is proposed for the University of Hawai'i – West O'ahu (UH West O'ahu). The BS-CYBR is a new technical cybersecurity program designed to provide students with an advanced cybersecurity education and will be UH West O'ahu's second STEM degree program. This advanced cybersecurity education deepens a student's knowledge of information security, mathematics, computer science, and computer engineering. It also prepares them to meet the advanced cybersecurity workforce requirements of public sector agencies and private sector enterprises.

According to the National Institute of Standards and Technology (NIST), the shortage of cybersecurity professionals is nearly three million. Only twenty-five percent of applicants to cybersecurity jobs are qualified, and it takes more than six months to fill a new cybersecurity position. NIST further predicts that computer and mathematical occupations will grow much faster than the average during 2016-2026.[1] According to the U.S. Department of Labor, the projected growth rate for Information security analyst jobs is 32% from 2018-2028.[2] A table summarizing additional statistics is below.

Information Security Analysts	
2018 Median Pay	$98,350 per year / $47.28 per hour
Typical Entry-Level Education	Bachelor's Degree
Work Experience in a Related Occupation	Less than 5 years
On-the-job Training	None
Number of Jobs, 2018	112,300
Job Outlook 2018-28	32% (much faster than average)
Employment Change, 2018-2028	35,500

Table 1. U.S. Bureau of Labor Statistics, Quick Facts: Information Security Analysts

In one instance involving the public sector, the U.S. Government Accounting Office found that "the Army activated a cyber battalion in December 2018, and as of March 2019, this unit was understaffed by more than 80 percent".[3]

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[1] Cybersecurity Workforce Demand, National Institute of Standards and Technology, National Institute for Cybersecurity Education,
https://www.nist.gov/sites/default/files/documents/2019/02/07/workforce_demand_111617_final.pdf (February 7, 2019).
[2] U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook,
https://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm (retrieved September 27, 2019).
[3] FUTURE WARFARE: Army Is Preparing for Cyber and Electronic Warfare Threats, but Needs to Fully Assess the Staffing, Equipping, and Training of New Organizations, U.S. Government Accountability Office, Report to Congressional Committees, https://www.gao.gov/assets/710/700940.pdf (August 2019).

The NIST National Initiative for Cybersecurity Education (NICE) defines seven workforce categories.[4]

Categories	Descriptions
Securely Provision (SP)	Conceptualizes, designs, procures, and/or builds secure information technology (IT) systems, with responsibility for aspects of systems and/or network development.
Operate and Maintain (OM)	Provides the support, administration, and maintenance necessary to ensure effective and efficient information technology (IT) system performance and security.
Oversee and Govern (OV)	Provides leadership, management, direction, or development, and advocacy, so the organization may effectively conduct cybersecurity work.
Protect and Defend (DR)	Identifies, analyzes, and mitigates threats to internal information technology (IT) systems and/or networks.
Analyze (AN)	Performs highly-specialized review and evaluation of incoming cybersecurity information to determine its usefulness for intelligence.
Collect and Operate (CO)	Provides specialized denial and deception operations and collection of cybersecurity information that may be used to develop intelligence.
Investigate (IN)	Investigates cybersecurity events or crimes related to information technology (IT) systems, networks, and digital evidence.

Table 2. NICE Workforce Categories

This new program covers all the workforce categories and specifically focuses on developing the advanced cybersecurity skills in the categories of Protect and Defend, Analyze, Collect and Operate, and Investigate. According to a study done by CyberSeek, a cybersecurity workforce project supported by NIST and the U.S. Department of Commerce[5], from October 2018 through September 2019, there were a total of 2,466 job openings and a total of 5,775 people in the cybersecurity workforce in Hawai'i.[6] The job openings during that time were distributed among the NICE workforce categories, as depicted below. Also, the table indicates the workforce categories of specific focus by the current Bachelor of Applied Science in Information Security and Assurance, and the proposed BS-CYBR.

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[4] National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework, NIST Special Publication 800-181, https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-181.pdf (retrieved February, 16, 2020).

[5] "About this tool", CyberSeek, https://www.cyberseek.org/index.html#aboutit (retrieved February 16, 2020).

[6] "Cybersecurity Supply/Demand Heat Map, https://www.cyberseek.org/heatmap.html (retrieved February 16, 2020).

Categories	Job Openings	BAS-ISA	BS-CYBR (proposed)
Securely Provision (SP)	979	X	X
Operate and Maintain (OM)	1650	X	X
Oversee and Govern (OV)	341	X	X
Protect and Defend (DR)	783	X	X
Analyze (AN)	369		X
Collect and Operate (CO)	188		X
Investigate (IN)	15		X

Table 3. Job Openings and Degree Correlation to NICE Workforce Categories

The present and growing cybersecurity threats further exacerbate the increasing gap between the number of job openings and the available qualified cybersecurity professionals. The number of vulnerabilities in software is growing.
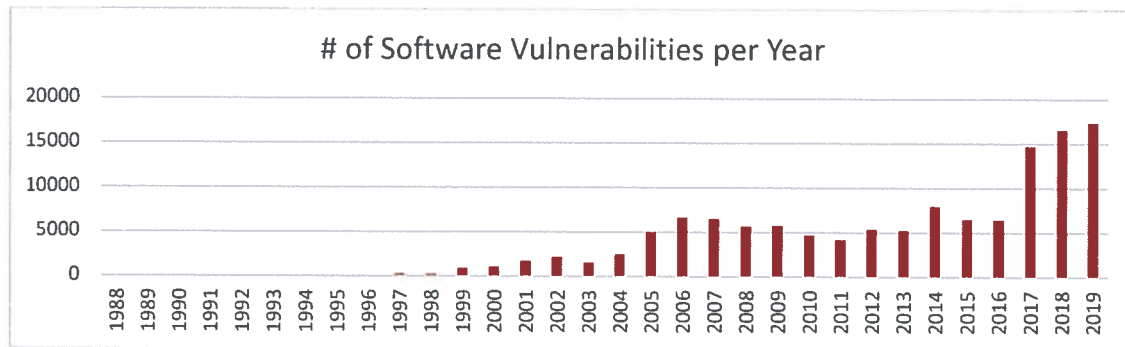
Figure 1. NIST National Vulnerability Database[7]

The attacks on Industrial Control Systems (ICS) and similar Operational Technology (OT) assets increased over 2000% since 2018.[8] ICS and OT assets are used for supervisory control and data acquisition (SCADA) systems that control machines in utilities, manufacturing, and other industrial use cases. The top five industries targeted by cybersecurity attackers in 2019 were: (1) Financial Services, (2) Retail, (3) Transportation, (4) Media and (5) Professional Services, and the number of records breached in 2019 was 8.5 billion.[9] According to the Verizon Data Breach Investigations Report, 71% of the breaches they investigated were financially motivated, with 56% of the breaches taking months or longer to discover.[10]

Hawai'i is particularly exposed as a target of these cybersecurity threats due to its unique position as:

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[7] "Statistics Results", National Vulnerability Database, https://nvd.nist.gov/vuln/search/statistics?form_type=Basic&results_type=statistics&search_type=all (retrieved February 16, 2020).

[8] "X-Force Threat Intelligence Index 2020", IBM Security, https://www.ibm.com/downloads/cas/DEDOLR3W, (retrieved February 16, 2020).

[9] Id.

[10] "2019 Data Breach Investigation Report", Verizon, https://enterprise.verizon.com/resources/reports/2019-data-breach-investigations-report.pdf (retrieved February 16, 2020).

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- Host to Headquarters, U.S. Indo-Pacific Command, federal facilities, and other U.S. intelligence agencies that require a sustained, qualified cyber workforce of college graduates in Hawai'i; and
- A center for the hospitality, financial, commerce, health, and technology industries in the Pacific.

The proposed BS-CYBR will directly address these threats and the cybersecurity needs of Hawai'i by developing local cybersecurity professionals with advanced skills that can immediately enter the workforce upon graduation.

Outcomes

The proposed BS-CYBR program will provide students with the necessary cybersecurity knowledge, skills, and experience to support the advanced cybersecurity requirements of public and private-sector entities.

The intended outcome of the proposed BS-CYBR program is to provide students with a focused education concentrating on cybersecurity. It builds upon a foundation in math, science, computer science and cybersecurity with advanced technical cybersecurity topics:

- Defensive and proactive activities
- Industrial Control Systems and SCADA cybersecurity
- Cyber investigations
- Cyber detection and response
- Communications and wireless technologies

As a result, graduates of the BS-CYBR will be able to holistically address the latest cybersecurity threats by applying the full spectrum of knowledge and advanced technical capabilities they acquired. Also, this curriculum is intended to align with the requirements of the National Security Agency (NSA) National Center of Academic Excellence in Cyber Operations.[11] The U.S. Department of Homeland Security recognizes degree programs in Cyber Operations, like the BS-CYBR, as a STEM field of study.[12]

Alignment with the UH System

The University of Hawai'i Integrated Academic and Facilities Plan (April 20, 2017) enumerates several guiding principles in applying resources efficiently, coherently, and collaboratively. This new program aligns with the following key principles: (1) minimizing the duplication of academic programs, (2) increasing and diversifying enrollment, and (3) prioritizing systemwide articulation and transferability in all academic planning.

Unique Program

This new program is unlike any program in Hawai'i by focusing on the technical and engineering aspects of cybersecurity as well as the full scope of global cyber implications. The diversity of offerings is

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[11] "Criteria for Measurement for CAE Cyber Operations Fundamental", National Security Agency Central Security Service, https://www.nsa.gov/resources/students-educators/centers-academic-excellence/cae-co-fundamental/ (retrieved February 16, 2020).

[12] STEM Designated Degree Program Lists Effective May 10, 2016, https://www.ice.gov/sites/default/files/documents/Document/2016/stem-list.pdf (retrieved February 16, 2020).

unmatched in the State and positions the University of Hawai'i to be among an elite list of universities in the country that meet the rigorous designation requirements of the National Security Agency (NSA) and the Department of Homeland Security (DHS) as Center of Academic Excellence in Cyber Operations.

Support Articulation of Courses System-Wide
All of the courses that meet university general education and lower-division requirements for this new program are offered by the University of Hawai'i campuses and are included in existing articulation agreements with Leeward, Honolulu, Kapi'olani and Windward Community Colleges. These existing articulation agreements will be expanded to provide pathways into the BS-CYBR program.

Increase and Diversify Enrollment
This new program requires students to complete highly technical cybersecurity curricula that relate to critical infrastructure and cybersecurity incident response investigations. It covers the three fundamental areas of cyber considerations: Information Networks, Defensive Cyber Security, and Proactive Cyber Security. This new program will be attractive to students who want to focus on the science, technology, and engineering of cybersecurity and cyber mission areas.

Alignment with the UH West O'ahu – Strategic Action Plan 2018-2028
The UH West O'ahu Strategic Action Plan identified opportunities and challenges that will impact the university's ability to fulfill its 10-year goals: (1) Creating a niche (opportunity), (2) Enrollment and retention (challenge), and (3) Distinguish from other 4-year institutions. This new program meets those opportunities and challenges.

Creating a Niche
The new program is an innovative baccalaureate degree program in a sought-after-field. Cybersecurity skills are in high demand. The BS-CYBR is unique as it focuses on the science, technology, and engineering of cybersecurity, as well as the complete breadth and scope that address all cybersecurity workforce domains.

Enrollment and Retention
New programs, degrees, and offerings such as the BS-CYBER will support increased enrollment and retention of both traditional and non-traditional students. The new program will draw students such as active-duty military personnel, law enforcement, current IT professionals desiring to specialize in cybersecurity, and new students who are seeking a more technical cybersecurity degree.

Distinguish from Other 4-year Institutions
This BS-CYBR will be UH West O'ahu's second Bachelor of Science degree, fulfilling the objective of expanding STEM education in the region. The BS-CYBER degree will also offer an opportunity for UH West Oahu to earn designation at an NSA/Department of Homeland Security (DHS) Center of Academic Excellence in Cyber Operations, the first in the State of Hawaii and one of the few in the U.S.

Program Organization

The BS-CYBR degree program establishes a solid math and science foundation to support a rigorous cybersecurity curriculum. The program is comprised of the following 120 credits:

- General Education: 31 credits
- Writing and Research: 9 credits
- Math and Statistics Requirements: 14 credits
- Cybersecurity Lower Division: 21 credits
- Cybersecurity Upper Division: 30 credits
- Capstone: 3 credits
- Electives: 12 credits (6 Upper and 6 Lower)

This program's course requirements focus on STEM and address the full breadth of cybersecurity mission areas: Network Operations, Defensive Cybersecurity, and Proactive Cybersecurity.

- Network Operations
  - ICS 111 Introduction to Computer Science I
  - ICS 211 Introduction to Computer Science II
  - ICS 184 Introduction to Networking
  - ICS 129 Introduction to Databases
  - ICS 240 Operating Systems
  - ISA 480C Communications and Wireless
- Defensive Cybersecurity:
  - ISA 275 Security Essentials
  - ISA 320 Fundamentals of Secure Software Programming;
  - ISA 340 Introduction to Digital Forensics
  - ISA 400 Management of Information Security
  - ISA 480I Cyber Investigations
  - ISA 480R Cyber Detection and Response
- Proactive Cybersecurity
  - ISA 330 Introduction to Proactive System Security
  - ISA 360 Cyber Competitions
  - ISA 430 Cybersecurity for Supervisory Control and Data Acquisition
  - ISA 450 Modern Cyber Conflicts

The math and statistics requirements include: MATH 115 Statistics, MATH 241 Calculus I, MATH 242 Calculus II, MATH 301 Introduction to Discrete Mathematics, SSCI 210 Statistical Analysis

The writing-intensive and research requirements include: SSCI 301 Methods & Techniques in Social Science Research, ITS 410 (WI) IT Project Management, APSC 486S (WI) Senior Project or APSC 490S (WI) Senior Practicum.

See Appendix A –Program Sheet, AY 2020-21 (draft) and Appendix B – Academic Map (draft)

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Student Demand

Over the last ten years, the BAS-ISA program has grown and is fulfilling a growing demand from students for a quality cybersecurity education. Demand for cybersecurity programs is strong and evidenced by the number of institutions that have earned the NSA's designation as a National Center in Academic Excellence (CAE) in Cyber Defense (CAE-CD) -- two-hundred and seventy-seven.[13] UH West Oʻahu, UH Maui, and UH Mānoa (Cyber Defense Research) are among them.

The Institutional Research Office of the University of Hawaiʻi – West Oʻahu provided a projection of enrollment in the BAS-ISA program through 2025 in the row labeled "1" in the table below. Row "2" is a projection should the new BS-CYBR program become available in the Fall of 2020.

Fall Semester	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Projections					
												2020	2021	2022	2023	2024	2025
BAS-ISA	12	25	36	58	76	82	77	106	141	160	169	162	151	164	170	182	190
BS-CYBR												34	60	67	71	77	81
												196	211	230	241	259	271

The projected enrollment with the new BS-CYBR considers the following:

- There is an expectation that a certain percentage of current BAS-ISA students will transition to the new BS-CYBR program over the next five years.
- Enrollment of a minimum average of 12 new students will enroll in the new BS-CYBR program over the next five years.

Program Resources and Efficiency

Resources

The new BS-CYBR program will be supported by existing resources supporting the BAS-ISA program. As a highly technical program, there is an additional focus on hands-on lab exercises. Therefore, lab resources, both physical and in the form of "cloud" or virtual resources, will be necessary as enrollment grows. A consistent issue with serving the UH West Oʻahu region is that, in many cases, students cannot purchase computers with sufficient capability to fully benefit from courses. Although a certain computing capacity is available on the UH West Oʻahu campus, this hands-on, lab-intensive program will likely exceed current computing resources at UH West Oʻahu as enrollment expands. However, for the initial program, funding is available through a grant from the Office of Naval Research (ONR) through AY 2019-2020 to complete required labs before the beginning of the Fall semester 2020. As enrollment increases, additional resources will be required, as indicated below. The resource projections below focus on the incremental resources required with the new BS-CYBR program.

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[13] Centers of Academic Excellence in Cyber Operations, National Security Agency Central Security Services, https://www.iad.gov/NIETP/reports/cae_designated_institutions.cfm (retrieved February 17, 2020).

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	Projections					
	2020	**2021**	**2022**	**2023**	**2024**	**2025**
BS-CYBR Students	34	60	67	71	77	81
FT Faculty	3	3	4	4	4	4
- Ratio	11	20	17	18	19	20
PT Faculty	2	2	2	2	2	2
Lecturers	2	2	3	3	3	3

The incremental annual expense starting in 2022 would be:

- $90,000 – Assistant Professor, Cybersecurity
- $10,000 - Lecturer

In terms of new facilities, a larger and modernized computer lab space will be required by 2021. At this time, there is a plan to utilize the space being vacated by the Creative Media program when that program moves to its new facilities in 2020. A lifecycle replacement for existing equipment and software will be required in 2022-23. That budget and funding source will be assessed at that time.

There is no cost to apply for and executing the due diligence to obtain the NSA CAE in Cyber Operations (CAE-CO) designation.

(CONTINUED ON THE NEXT PAGE)

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Program Differentiators

The University of Hawai'i (UH) system is fortunate to have more than one cybersecurity program. The most comparable programs to the new BS-CYBR are the Bachelor of Applied Science, Information Security and Assurance (UH West O'ahu) (BAS-ISA), and Bachelor of Science, Computer Science with Security Science Focus (UH Mānoa) (BS-CS SecSci). Below is a table enumerating the required cybersecurity-related courses for each program and clearly illustrates how each program differs from each other. Although they all share many foundational lower-division courses, they quickly diverge in the upper-division with separate focuses.

COURSE TOPIC	UHWO BS-CYBR	UHWO BAS-ISA	UHM BS-CS SecSci
Introduction to Computer Science I	ICS 111	ICS 111	ICS 111
Introduction to Computer Science II	ICS 211	ICS 211	ICS 211
Introduction to Databases	ICS 129	ICS 129	ICS 321
Introduction to Networking	ICS 184	ICS 184	ICS 315/351
Introduction to Discrete Mathematics	MATH 301		ICS 141
Operating Systems	ICS 240	ICS 240	ICS 332
Security Essentials	ICS 275	ICS 275	
Fundamentals of Secure Software Programming	ISA 320	ISA 320	
Introduction to Proactive System Security	ISA 330	ISA 330	
Introduction to Digital Forensics	ISA 340	ISA 340	
Management of Information Security	ISA 400	ISA 400	
IT Project Management	ITS 410	ITS 410	
Modern Cyber Conflicts	ISA 450	ISA 450	
Cyber Competitions	ISA 360		
Cybersecurity for SCADA	ISA 430		
Cyber Investigations	ISA 480I		
Cyber Detection and Response	ISA 480R		
Communications and Wireless	ISA 480C		
Capstone Project or Practicum	CYBR 486/490	ISA 486/490	
Program Structure			ICS 212
Discrete Mathematics for Computer Science II			ICS 241
Software Engineering I			ICS 314
Security and Trust I: Resource Protections			ICS 355
Security and Trust II: Information Assurance			ICS 455
Data Security and Cryptography			ICS 423
Software Engineering II or Artificial Intelligence for Games			ICS 414/464
Computer Security and Ethics or Computer System Security			ICS 425/426
Special Topics or Special Topics in Security			ICS 491/495

Another differentiating factor is the BS-CYBR's design is to meet the criteria to earn NSA's CAE-CO. *See* Appendix C – NSA-CAE Cyber Operations Fundamentals. As colleges mature their CAE-CD programs, the next level of cybersecurity education that students will seek, and institutions will need to offer, include

programs that address the complete set of cyber implications. At this time, only twenty-one institutions have achieved the CAE-CO designation.[14] Upon earning this designation, the BS-CYBR program will be among an elite group of programs in the nation, and the only program in the State recognized as a CAE-CO.

Finally, the BS-CYBR program at UH West Oʻahu addresses the flexibility needs of full-time students and working professionals. Lower-division requirements can be completed at the community colleges and transferred pursuant articulation agreements. Also, eleven (11) of the upper-division courses are hybrid courses that combine the face-to-face classroom learning with online learning. This flexibility makes this BS-CYBR program responsive to the needs of degree-seeking professionals, including government employees, active/reserve military personnel, and working private-sector professionals.

Program Effectiveness

Assessment: Program effectiveness will be determined by looking at student achievement data. Student achievement data include the number of declared majors, annual degree attainment, and the number of students who graduate within five years. The attainment of the program's student learning outcomes will be assessed as part of the established and ongoing assessment process.

The proposed BS-CYBR will be subject to the campus Program Review process every five years, Annual Report of Program Data, and appropriate Western Association of Schools and Colleges (WASC) Senior College and University Commission (WSCUC) accreditation processes in which all programs participate. The Program Review process requires programs to report progress on student achievement data, perform an analysis of the course and program student learning outcomes assessment, review current curriculum and recommend changes, and determine the future need for additional resources.

Conclusion

There is an urgent need for highly skilled cybersecurity professionals across all industries. The proposed Bachelor of Science in Cybersecurity addresses this need by providing students a pathway to acquire this specialized knowledge and to practice these skills under provisional supervision. By hiring BS-CYBR graduates with these skills, employers with advanced cybersecurity requirements can be confident in their ability to identify, protect, detect, respond, and recover from cybersecurity threats.

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[14] Centers of Academic Excellence in Cyber Operations, National Security Agency Central Security Services, https://www.nsa.gov/resources/students-educators/centers-academic-excellence/cae-co-centers/ (retrieved February 17, 2020).

Appendix A – Program Sheet, AY 2020-21 (draft)

Bachelor of Science in Cybersecurity, Cyber Operations

The goal of academic advising is to further enhance the educational mission of the university, and create quality, accessible advising partnerships with all students in a positive environment that supports student success. This advising sheet is for tracking purposes toward degree completion and is subject to change. Students also may track their academic progress via STAR Degree Check through STAR at www.star.hawaii.edu. Academic Advising appointments may be scheduled by calling 808-689-2689 or toll-free from neighbor islands at 866-299-8656.

Graduation Requirements (see the 2020-2021 catalog for any additional graduation requirements):

☐ 45 Upper Division Credits Minimum
☐ 120 Total Credits Minimum
☐ 30 UHWO Credits

☐ 3 Upper Division Writing Intensive Courses
☐ Focus Requirements (OC, HAP, ETH)

☐ 2.0 *UHWO GPA*
☐ 2.0 *CONCENTRATION GPA*

General Education Requirements: 31 credits

Credits	Course Alpha / Number / Title
3	Foundations Written Communications (FW) ENG 100 Composition I
3	Foundations Symbolic Reasoning (FS) OR Foundations of Quantitative Reasoning (FQ) Recommend MATH 115 Statistics
6	Foundations Global and Multicultural Perspectives (FG): 6 credits from two *different* groups (A, B, C): *Group A: Primarily before 1500 CE (e.g., HIST 151 or ANTH 151) *Group B: Primarily after 1500 CE (e.g., HIST 152 or ANTH 152) *Group C: Pre-history to present
6	Diversification Arts, Humanities & Literature (DA, DH, DL): 6 credits from two different areas
3	Diversification Social Sciences (DS): 6 credits from two different areas
3	Diversification Social Sciences (DS): Different area from above.
3	Diversification Natural Sciences (DB, DP, DY): 3 credits from the biological sciences (DB):
3	3 credits from the physical sciences (DP): Recommend PHYS 151
1	1 credit of laboratory (DY): Recommend PHYS 151L

Writing Skills Requirements: 3 credits

Credits	Course Alpha / Number / Title
3	ENG 200 Composition II or ENG 209 Business Writing

Cybersecurity Math and Statistics Requirements: 14-17 credits

Credits	Course Alpha / Number / Title
0-3	MATH 115 Statistics *(may also count as FQ in General Education Above)*
4	MATH 241 Calculus I
4	MATH 242 Calculus II
3	SSCI 210 Statistical Analysis I
3	MATH 301 Introduction to Discrete Mathematics

Cybersecurity Core Requirements: 42-46 credits

Credits	Course Alpha / Number / Title
0-3	PHYS 151 College Physics *(may also count as DP in General Education Above)*
0-1	PHYS 151 L College Physics Lab *(may also count as DY in General Education Above)*
3	SSCI 301 Methods & Techniques in Social Science Research (Ethics Focus)
3	ITS 410 IT Project Management (WI)
3	ICS 101 Digital Tools for Info World
3	ICS 111 Introduction to Computer Science I
3	ICS 113 Database Fundamentals OR ICS/ITS 129 Introduction to Databases

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Credits	Course Alpha / Number / Title
3	ICS 184 Introduction to Networking
3	ICS 211 Introduction to Computer Science II
3	ICS 240 Operating Systems
3	ISA 275 Security Essentials OR CSNT 275 Security Essentials
3	ISA 320 Fundamentals of Secure Software Programming
3	ISA 330 Introduction to Proactive System Security
3	ISA 340 Introduction to Digital Forensics
3	ISA 400 Management of Information Security
3	ISA 450 Modern Cyber Conflicts (Ethics Focus Designation Pending)

Cyber Operations Concentration Requirements: 15 credits

Credits	Course Alpha / Number / Title
3	ISA 360 Cyber Competitions
3	ISA 430 Cybersecurity for Supervisory Control and Data Acquisition
3	ISA 480I Topics in ISA: Cyber Investigations
3	ISA 480R Topics in ISA: Cyber Detection and Response
3	ISA 480C Topics in ISA: Communications and Wireless

Capstone Requirement: 3 credits

Credits	Course Alpha / Number / Title
3	CYBR 486S Senior Project or CYBR 490S Senior Practicum (WI)

Elective Requirements: 5-12 credits

*See your Student Success Counselor to determine how many elective credits are needed.

Credits	Course Alpha / Number / Title
3	Upper Division (300-400 Level) Recommend: MATH, HLTH, PUBA, FORS or BUSA (examples: BUSA 340 Business Intelligence, BUSA 342 Practical Programming: Python, BUSA 348 Data Analytics for Business, BUSA 349 Data Analytics on the Cloud)
3	Recommend MATH, HLTH, PUBA, FORS
3	Recommend MATH, HLTH, PUBA, FORS
3	Recommend MATH, HLTH, PUBA, FORS

NOTES:
* The Faculty contact for this concentration is Michael Miranda, he may be contacted at mmirand1@hawaii.edu or 689-2481

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Appendix B – Academic Map (draft)

University of Hawai'i West O'ahu – BS-CYBR 4-year Academic Map 2020-21

Graduation Requirements

- 45 Upper Division Credits Minimum
- 120 Total Credits Minimum
- 30 UHWO Credits Minimum

- 3 Upper Division Writing Intensive Courses
- Focus Requirements (OC, HAP, ETH)

- 2.0 OVERALL GPA
- 2.0 UHWO GPA
- 2.0 CONCENTRATION GPA

Year 1

SEMESTER 1			SEMESTER 2		
REQ Fulfilled	**COURSE**	**CR**	**REQ Fulfilled**	**COURSE**	**CR**
Written CommFW	ENG 100	3	CYBR LD Concentration	ICS 111	3
CYBR LD Core	ICS 101	3	CYBR LD Concentration	ICS 113 or 129	3
FQ	Recommend: MATH 115	3	DA/DH/DL		3
FGA/FGB/FGC	_____	3	Natural Sciences (DP or DP)	Physical Science	3
DA/DH/DL	Recommend: HWST 107 or HAP	3	Natural Sciences (DY)	Lab	1
			Elective	_____	3
Credits		**15**	**Credits**		**16**
MILESTONE: Completion of ENG 100 and ICS 101; start Math			MILESTONE: Completion of ICS 111 and ICS 113/129; prepared for MATH 241		

Year 2

SEMESTER 3 Fall			SEMESTER 4 Spring		
REQ Fulfilled	**COURSE**	**CR**	**REQ Fulfilled**	**COURSE**	**CR**
CYBR LD Concentration	MATH 241	4	CYBR LD Concentration	MATH 242	4
Writing Skills	ENG 200 or ENG 209/210/215	3	CYBR LD Concentration	ICS 240	3
CYBR LD Concentration	ICS 184	3	CYBR LD Concentration	ISA 275/CSNT 275	3
CYBR LD Concentration	ICS 211	3	CYBR Math – Statistics	SSCI 210	3
Social Sciences (DS)	_____	3	Elective	Recommend: PUBA 101 (also DS)	3
Credits		**16**	**Credits**		**16**
MILESTONE: Completion of MATH 241, ICS 184, ICS 211			MILESTONE: Completion of MATH 242, ICS 240, ICS 275, SSCI 210		

Year 3

SEMESTER 5 Fall			SEMESTER 6 Spring		
REQ Fulfilled	**COURSE**	**CR**	**REQ Fulfilled**	**COURSE**	**CR**
CYBR Concentration	ISA 320	3	CYBR Concentration	ISA 340	3
CYBR Concentration	ISA 330	3	CYBR Methods and (DS)	SSCI 301	3
CYBR Math	MATH 301	3	FGA/FGB/FGC	_____	3
UD Elective	Recommend: BUSA 342	3	Natural Sciences (DP or DP)	Biological or Physical Science	3
UD Elective	Recommend: BUSA 386 (WI)	3	Elective		3
Credits		**15**	**Credits**		**15**
MILESTONE: Completion of ISA 320, ISA 330, and first upper division WI			MILESTONE: Completion of ISA 340 and SSCI 301		

Year 4

SEMESTER 7 Fall			SEMESTER 8 Spring		
REQ Fulfilled	**COURSE**	**CR**	**REQ Fulfilled**	**COURSE**	**CR**
CYBR Writing	ITS 410 (WI)	3	CYBR UD	ISA 430 – Spring only	3
CYBR UD	ISA 400	3	CYBR UD	ISA 480R – Spring only	3
CYBR UD	ISA 450	3	Elective	Recommend: ETH	3
CYBR UD	ISA 360	3	CYBR Capstone & WI	CYBR 486S (WI) or CYBR 490S (WI)	3
CYBR UD	ISA 480I	3			
Credits		**15**	**Credits**		**12**
MILESTONE: Completion of ITS 410, ISA 400, and ISA 450. Schedule a final degree audit with your Academic Advisor.			MILESTONE: Completion of Capstone course; Graduate!		

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Appendix C – NSA-CAE Cyber Operations Fundamentals

Another objective of this program is to qualify UH West O'ahu for an additional designation as an NSA Center of Academic Excellence in Cyber Operations Fundamentals. To achieve this designation, the BS-CYBR must include the necessary content[15]:

1. **MANDATORY**
   a. M.1 Low Level Programming Languages (must include programming assignments to demonstrate that students are capable of the desired outcomes)
   b. M.2 Software Reverse Engineering (must include hands-on lab exercises)
   c. M.3 Operating System Theory
   d. M.4 Networking (must include hands-on lab exercises)
   e. M.5 Cellular and Mobile Technologies
   f. M.6 Discrete Math and Algorithms
   g. M.7 Overview of Cyber Defense (must include hands-on lab exercises)
   h. M.8 Security Fundamental Principles (i.e., "First Principles")
   i. M.9 Vulnerabilities
   j. M.10 Legal and Ethics
2. **OPTIONAL CONTENT (10 of the following 17)**
   a. O.1 Programmable Logic (must include hands-on lab exercises)
   b. O.2 Wireless Security (must include hands-on lab exercises)
   c. O.3 Virtualization -> should be Virtualization (must include hands-on lab exercises)
   d. O.4 Cloud Security/Cloud Computing
   e. O.5 Risk Management of Information Systems
   f. O.6 Computer Architecture (includes Logic Design)
   g. O.7 Microcontroller Design (must include hands-on lab exercises)
   h. O.8 Software Security Analysis (must include hands-on lab exercises)
   i. O.9 Secure Software Development (Building Secure Software) (includes hands-on labs)
   j. O.10 Embedded Systems (must include hands-on lab exercises)
   k. O.11 Digital Forensics (must include hands-on lab exercises)
   l. O.12 Systems Programming (must include hands-on lab exercises)
   m. O.13 Applied Cryptography
   n. O.14 Industrial Control System (ICS)
   o. O.15 User Experience (UX)/Human Computer Interface (HCI) Security
   p. O.16 Offensive Cyber Operations
   q. O.17 Hardware Reverse Engineering (must include hands-on lab exercises)

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[15] https://www.nsa.gov/Resources/Students-Educators/centers-academic-excellence/cae-co-fundamental/requirements/

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Committee on Academic and Student Affairs
Annual Review for Academic Year 2019-2020

	Committee Goals and Objectives	2019-2020 Accomplishments
1	Review the academic mission and strategic direction of the system and its major units.	• Report on Draft Academic Master Plan (02/06/20)
2	Periodically review to what extent programs support the mission and strategic direction of the University.	• Report on Draft Academic Master Plan (02/06/20)
3	Monitor the quality and effectiveness of educational programs.	• Accreditation Follow-Up Report to the Accrediting Commission for Community and Junior Colleges, Kapiʻolani Community College (02/06/20) • Accreditation Follow-Up Report to the Accrediting Commission for Community and Junior Colleges, Leeward Community College (02/06/20) • Report on Draft Academic Master Plan (02/06/20)
4	Develop and maintain policies governing academic and student affairs.	• Report on Draft Academic Master Plan (02/06/20) • *UH Student Caucus Spring 2020 Update (05/21/20 Pending)*

5	Review actions proposed by the President which fall under current board policies and procedures, including requests for exceptions.	**Provisional Status for New Programs:** • *Bachelor of Science in Cybersecurity, University of Hawaiʻi – West Oʻahu (05/21/20 Pending)* **Provisional to Established Status:** • Bachelor of Science in Computer Engineering, University of Hawaiʻi at Mānoa (11/07/19) • Doctor of Education in Professional Education Practice, University of Hawaiʻi at Mānoa (11/07/19) • *Bachelor of Arts in Public Health, University of Hawaiʻi at Mānoa (05/21/20 Pending)* • *Bachelor of Arts in Pharmacy Studies, University of Hawaiʻi at Hilo (05/21/20 Pending)* • *Doctor of Science in Marine Biology, University of Hawaiʻi at Mānoa (05/21/20 Pending)* • *Master of Science in Marine Biology, University of Hawaiʻi at Mānoa (05/21/20 Pending)* • Report on Draft Academic Master Plan (02/06/20)
6	Review the quality and effectiveness of the University's efforts in addressing emergency workforce needs.	• Report on Draft Academic Master Plan (02/06/20)

Note: Items (1) through (5) are pursuant to the Board of Regents Bylaws as of February 28, 2019.

Item IV.F

UH Student Caucus Spring 2020 Update

VIDEO:

[http://www.hawaii.edu/offices/bor/academic-2015/materials/202005210830/IV.F_UHSC_Update___Video.mp4]

SUPPORTING MATERIALS:

[http://www.hawaii.edu/offices/bor/academic-2015/materials/202005210830/IV.F_UHSC_Update___Supporting_Documents.pdf]