The main goal of my sabbatical leave was to find efficient and effective ways to recruit, retain and support student transfer from Leeward Community College. This goal was divided into two sub-goals. Even when they may seem unrelated, both of them help recruit, retain and improve student success, as it will be explained in the following narrative. The goals are:

1. To establish a systematic approach to recruit and retain women and minorities in our STEM programs, especially computer science.
2. To establish an undergraduate research program for computer science and engineering students at Leeward Community College that will continue their education at the University of Hawaii at Manoa.

Goal 1

To establish a systematic approach to recruit and retain women and minorities in our STEM programs, especially computer science.

The problem: Culturally we are lead to believe that computer science is for men therefore women themselves oftentimes count themselves out of the computer science workforce even before they give it a try.

Related Activities

Presented a Research Paper.
I began my sabbatical by presenting a paper in the “Human Computing Interaction International” conference in Las Vegas NV. With a paper entitled “Applying Studio-Based Learning Methodology in Computer Science Education to Improve 21st Century Skills”, based on the work I do with my students and my previous research. My efforts to make our instructional approaches more inclusive are part of a novel approach to recruit and retain diverse students into our program. I presented the paper on July 18th 2018. Our Leeward Community College travel fund helped me get there, thank you!

Review Committee for the Grace Hopper Women in Computer Conference
I participated in the Grace Hopper Women in Computer Conference committee by reviewing applications for “Products A to Z”, which involved reviewing an average of 30 proposal papers submitted from all over the united states to obtain a grant as well as recognition from their participation and proposed product. 
https://ghc.anitab.org/ghc-18-committees/
Collaborated in the writing of “Lighting the Path: From Community College to Computing Careers” Report written by the ACM Education Policy Committee.

I collaborated in the “Lighting the Path: From Community College to Computing Careers” Report written by the ACM Education Policy Committee. It is very important to note that ACM (Association of Computing Machinery) is the most important publication for computer science professors and computer science universities in the United States and perhaps the world. [https://www.acm.org/media-center/2018/october/epc-report-on-community-colleges](https://www.acm.org/media-center/2018/october/epc-report-on-community-colleges)

The report may be downloaded at [https://www.acm.org/binaries/content/assets/education/lighting-the-path-from-community-college-to-computing-careers.pdf](https://www.acm.org/binaries/content/assets/education/lighting-the-path-from-community-college-to-computing-careers.pdf)

You will find my name at the beginning and references to our student transfers in page 14 of this report. Working on this report helped me reflect on what we are doing well and those aspects in which we need to focus.

Co-Investigator in the joint application for the “Community College Cyber Pilot Program”

I joined as a co-investigator in the joint application for the “Community College Cyber Pilot Program” Alongside Jodi Ito and other community college leaders. This was done with the goal of attracting more students into our cybersecurity program. Sadly we did not get funded. Please see attachments for the work done and the commitment on my part.
Goal 2

To establish an undergraduate research program for computer science and engineering at Leeward Community College that will continue and collaborate with the University of Hawaii at Manoa.

The computer science program has been focusing on transferring students to UHWO due to our geographical location. This changed with the introduction of the AS-NS ICS, however, a course in research will greatly enhance the critical thinking skills of those students transferring to UHM.

I systematically dedicated two days per week to do research on research courses offered throughout the UH system as well as to contact the instructors teaching those courses whenever necessary. I proposed SCI 298R course during the curriculum committee meeting held on Dec 6th 2018. The course is now in Kuali as SCI298R and can be found here:

https://leeward.kuali.co/cm/#/courses/view/5b9c41448c4b7e2e0097c2d6

SCI298R is an interdisciplinary course as opposed to others courses being offered. This has been done with the goal of widening students’ research perspective instead of narrowing it, as research oftentimes goes. After much discussion during the Dec 6th meeting the curriculum committee proposed that the course will ran as a temporary course in order to gauge the demand. However, due to the increased demand for computer science courses I have not yet been able or scheduled to do this.

The following is the result of the findings related to similar research courses.
Courses similar to SCI298R
Intro to Research Ethics and Research Methods

The courses listed below are specific to a particular discipline. Historically, STEM fields tend to support each other’s research in interdisciplinary fields such as bio-engineering, cryptography, genetics, design, data science, etc. The proposed course, SCI 298R, will benefit from the students’ background diversity, which will allow students to learn from each other’s fields of research. Interacting with each other will also allow them to find out ways in which their fields may interact in the real world.

While all the undergrad research courses focus on the scientific process, SCI298R takes much into consideration the ethics of research process, the process of setting up the research, as well as writing and presenting the and where the research fits within their field as well as other STEM fields.

All the KapCC courses allow for variable credits. This course has fixed credits because there are expectations and SLOs that all students must meet at the same degree in order to pass the course. Just like research projects have deadlines, this course will. Oral presentations as well as written reports are expected at different points throughout the semester.

The SCI298R SLOs differ from the other courses as follows:

1. Design and plan a research plan
   This course focuses on this part of the research. This is very similar to a project proposal defense, which should be done in a limited amount of time while a full on research product may need different times depending on the project.

2. Identify ethical issues that arise from conducting research and assess possible scenarios.
   This SLO is not covered in other research courses. Students will benefit from sharing the classroom with students in different disciplines to experience and understand the repercussions that research has in the different fields.

3. Deliver an oral presentation of the research design
   Throughout the semester, students should be able to appropriately and professionally share their ideas and thoughts with their classmates.
At Leeward Community College

PSY 212 Survey of Research Methods
Survey of standard methods and related conceptual issues employed in psychological research. Both experimental and non-experimental methods will be reviewed.

SCI 295EN STEM Research Experience in Engineering (1-3)
SCI 295EN offers research experience in science, technology, engineering and/or mathematics, emphasizing the application of the engineering design process to a specific project.
Opportunities at the Bio Tech lab with Dr. Neupane
At Kapi‘olani Community College

**SCIENCE SCI 295 (Alpha) STEM Research Experience** (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Completion of a lab science course as stipulated by the instructor.
Comment: Letter grade only. SCI 295 (alpha) may not be audited. SCI 295 (alpha) may not be taken credit/no credit.

SCI 295 (alpha) offers a research experience in science, technology, engineering and/or mathematics, emphasizing the application of the scientific method to a specific project.

Upon successful completion of SCI 295 (alpha), the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.

**SCI 295BL STEM Research Experience in Biology and/or Marine Biology** (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: BIOL 171L or equivalent science lab course.
Comment: Letter grade only. SCI 295BL may not be audited. SCI 295BL may not be taken credit/no credit.

SCI 295BL offers a research experience in science, technology, engineering and/or mathematics, emphasizing the application of the scientific method to a specific project in biology and/or marine biology.

Upon successful completion of SCI 295BL, the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.
**SCI 295BT STEM Research Experience in Botany (1-3) KCC AA/DY**

3 hours cooperative education/work experience per week per credit

Prerequisite(s): Consent of instructor.

Recommended Preparation: Completion of a lab science course as stipulated by the instructor.

Comment: Letter grade only. SCI 295BT may not be audited. SCI 295BT may not be taken credit/no credit.

SCI 295BT offers a research experience in science (botany), technology, engineering and/or mathematics, emphasizing the application of the scientific method to a specific project in biology and/or marine biology.

Upon successful completion of SCI 295BT, the student should be able to:

1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.

**SCI 295CH STEM Research Experience in Chemistry (1-3) KCC AA/DY**

3 hours cooperative education/work experience per week per credit

Prerequisite(s): Consent of instructor.

Recommended Preparation: Credit in or concurrent enrollment in CHEM 161 and credit in or concurrent enrollment in 161L course, as stipulated by the instructor.

Comment: Letter grade only. SCI 295CH may not be audited. SCI 295CH may not be taken credit/no credit.

SCI 295CH offers a research experience in science, technology, engineering and/or mathematics, emphasizing the application of the scientific method to a specific project in chemistry.

Upon successful completion of SCI 295CH, the student should be able to:

1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.
SCI 295CS STEM Research Experience in Computer Sciences (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Credit or concurrent enrollment in ICS 111.
Comment: Letter grade only. SCI 295CS may not be audited. SCI 295CS may not be taken credit/no credit. SCI 295CS can be repeated up to a maximum of 6 credits.

SCI 295CS offers a research experience in science, technology, engineering and/or mathematics, emphasizing the application of the scientific method to a specific project in computer sciences.
Upon successful completion of SCI 295CS, the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.

SCI 295EC STEM Research Experience in Ecology (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Completion of introductory or majors biology/ecology course or demonstrated interest in research or ecological management, as stipulated by the instructor.
Comment: Letter grade only. SCI 295EC may not be audited. SCI 295EC may not be taken credit/no credit.
SCI 295EC offers a research experience in emphasizing the application of the scientific method to an ecology project.
Upon successful completion of SCI 295EC, the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.
SCI 295EN STEM Research Experience in Engineering (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Completion of a calculus-based physics course as stipulated by the instructor.
Comment: Letter grade only. SCI 295EN may not be audited. SCI 295EN may not be taken credit/no credit.
SCI 295EN offers research experience in science, technology, engineering and/or mathematics, emphasizing the application of the engineering design process to a specific project.
Upon successful completion of SCI 295EN, the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.

SCI 295ES STEM Research Experience in Environmental Science (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Completion of introductory or majors ecology or environmental science course or demonstrated interest in environmental science, as stipulated by the instructor.
Comment: Letter grade only. SCI 295ES may not be audited. SCI 295ES may not be taken credit/no credit.
SCI 295ES offers a research experience in Environmental Science emphasizing the application of the scientific method to research or projects.
Upon successful completion of SCI 295ES, the student should be able to:
1. Formulate a hypothesis or research question.
2. Design methods to test a hypothesis or research question.
3. Collect and analyze data as appropriate.
4. Document and formally present results of research project to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab or field setting.
SCI 295MA STEM Research Experience in Mathematics (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Completion of a calculus course, eg., MATH 241 or higher.
Comment: Letter grade only. SCI 295MA may not be audited. SCI 295MA may not be taken credit/no credit.
SCI 295MA offers research experience in science, technology, engineering and/or mathematics, emphasizing the application of mathematical techniques to analyze or model a specific project.

Upon successful completion of SCI 295MA, the student should be able to:
1. Formulate a hypothesis
2. Design methods to test a hypothesis
3. Collect and analyze data as appropriate
4. Document and formally present results of hypothesis testing to an audience
5. Enhance understanding of scientific concepts
6. Collaborate as a member of a research team
7. Work responsibly in a lab setting

SCI 295MI STEM Research Experience in Microbiology and/or Molecular Biology (1-3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Completion of a microbiology and/or molecular biology lab science course, as stipulated by the instructor.
Comment: Letter grade only. SCI 295MI may not be audited. SCI 295MI may not be taken credit/no credit.
SCI 295MI offers a research experience in science, technology, engineering and/or mathematics, emphasizing the application of the scientific method to a specific project in microbiology and/or molecular biology.
Upon successful completion of SCI 295MI, the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.
**SCI 295PL STEM Research Experience in Physiology** (1 - 3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Completion of a lab science course as stipulated by the instructor.
Comment: Letter grade only. SCI 295PL may not be audited. SCI 295PL may not be taken credit/no credit.
SCI 295PL offers a research experience in physiology, emphasizing the application of the scientific method to a specific project.
Upon successful completion of SCI 295PL, the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
7. Work responsibly in a lab setting.

**SCI 295PS STEM Research Experience in Physics** (1 - 3) KCC AA/DY
3 hours cooperative education/work experience per week per credit
Prerequisite(s): Consent of instructor.
Recommended Preparation: Credit or concurrent enrollment in PHYS 170 and credit or concurrent enrollment in PHYS 170L.
Comment: Letter grade only. SCI 295PS may not be audited. SCI 295PS may not be taken credit/no credit. SCI 295PS can be repeated up to a maximum of 6 credits.
SCI 295PS offers a research experience in science, technology, engineering and/or mathematics, emphasizing the application of the scientific method to a specific project in physics.
Upon successful completion of SCI 295PS, the student should be able to:
1. Formulate a hypothesis.
2. Design methods to test a hypothesis.
3. Collect and analyze data as appropriate.
4. Document and formally present results of hypothesis testing to an audience.
5. Enhance understanding of scientific concepts.
6. Collaborate as a member of a research team.
# Intro to Research Ethics and Research Methods

**SCI 298R**

[https://leeward.kuali.co/cm/#/courses/view/5b9c41448c4b7e2e0097c2d6](https://leeward.kuali.co/cm/#/courses/view/5b9c41448c4b7e2e0097c2d6)

Fall 2019 — Indefinite  
View Original Proposal  
Table of Contents

## BASIC INFO

1) Start Term  
   Fall 2019  
2) Subject Code  
   SCI  
4) Division  
   Math & Science  
3) Number  
   298R  
5) Title  
   Intro to Research Ethics and Research Methods  
6) Banner Title  
   Intro Ethics & Research  
7) Review Date (Academic Year)  
   2018-2019  
8) Similar Courses at Other UH Campuses  
   No Course Matches  
9) Similar Courses at UH Campuses with Different Alpha and/or Number

## GENERAL INFORMATION

1) Catalog Description  
   This course provides STEM students with an opportunity to establish or advance their understanding of research through a critical exploration of research language with a heavy emphasis on ethics. This course will help enhance written and spoken communication skills as a way to prepare students to present research findings.  
2) Equivalent Course(s), if Any

3) Display in Catalog  
   No  
4) Credit Options  
   3
5) Repeatability

6) Grading Options
   Credit/No Credit (C)
   Standard Letter A-F (L)

7) Schedule Types
   LEC - Lecture

8) Contact Hours Per Week
   Activity Type
   Lecture
   Lab
   Other
   0

REQUISITE INFORMATION

1) Prerequisite(s)

   Complete all of the following
   Earned a minimum grade of C in each of the following:
   ENG100 - Composition I (3)
   Complete 1 of the following
   Earned a minimum grade of C in each of the following:
   SP151 - Personal and Public Speech (3)
   Earned a minimum grade of C in each of the following:
   SP251 - Principles of Effective Public Speaking
           instructor approval.

2) Corequisites
   No Rules

3) Recommended Course Preparation
   none

4) Other Recommended Preparation
   Proficient computer user
CONTENT
1) Course Content

SCI 298R is a STEM research course with heavy emphasis on ethics, writing and critical thinking. This course provides a comprehensive introduction to research ethics, proposal writing, methodologies, and foundational research theories and protocols. Students will learn about the cyclical nature of applied research and the iterative process of research writing as well as deepen their ethical awareness of the research process.

The curriculum is sequential, helping students to identify a study topic, formulate inquiry questions, organize a literature review and select appropriate research designs and methodologies, all under the umbrella of the UH required ethical practices.

By the end of the semester, students will complete a written proposal including an introduction, problem statement, literature review, methods selection, and a project timeline. Students will present their proposals as well as a research poster in a conference-like setting at the end of the semester. By the end of the semester, students will take and pass the research ethics and compliance UH online training. (https://www.hawaii.edu/researchcompliance/get-training-avs.)

2) Learning Outcomes

Design and write a research plan.
Identify ethical issues that arise from conducting research and assess possible solutions.
Deliver a presentation of the research design.

3) Justify the level of proposed course

This course covers all topics normally included in undergraduate research courses as evidenced by available texts in research and the topics covered by other undergraduate college-level research courses, according to college catalogs and review of course outlines. The course covers all topics needed to gain a fundamental understanding of research and its ethical implications as well as the moral and legal obligations of a researcher.

4) Method of Instruction

Class discussions
Group discussions
Internet, database and library research
UH Institutional review board site
Lectures
Student reports and projects
Tutoring for writing as well as technology use as needed.
5) DISTANCE EDUCATION
   not applicable

6) COURSE DEPENDENCIES
   There are no dependencies

7) ATTACHMENTS
   similar-research-courses-SCI275.docx

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**Proposed SCI 298R Course Assessment**

Since assessment is a very important element for Leeward Community College’s status as an accredited institution, my sabbatical work includes the learning outcomes along with an assessment rubric listed in the following page.

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1 name when originally proposed
<table>
<thead>
<tr>
<th>Learning outcome</th>
<th>Excellent</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design and plan a research proposal</strong></td>
<td>Student shows comprehensive evidence of planning and time management. Student addresses each project requirement. Works efficiently and meets all “road map” dates on time.</td>
<td>Student shows some evidence of planning and time management. Student addresses most project requirement. Works efficiently and meets all “road map” dates on time.</td>
<td>Student shows some evidence of planning and time management. Student addresses most project requirement. Meets some “road map” dates on time.</td>
<td>Does not manage time well; attempts to make up lost time in final weeks of project.</td>
</tr>
<tr>
<td></td>
<td>Constructs a testable hypothesis and clearly designs appropriate tests and/or data collection strategies. Actively seeks pertinent literature. Suggests new experiments. Offers independent interpretation of data.</td>
<td>Constructs a testable hypothesis and designs appropriate tests and/or data collection strategies. Is familiar with literature supplied by advisor.</td>
<td>Constructs a testable hypothesis and designs appropriate tests and/or data collection strategies. Is familiar with only one or two supplied papers.</td>
<td>Demonstrates little independent thought and remains uninformed on the relevant literature.</td>
</tr>
<tr>
<td></td>
<td>Independently and in great detail proposes a methodology for the collection high-quality original data and demonstrates a full understanding of the uncertainty associated with each datum.</td>
<td>Proposes methodology for the collection high-quality original data and demonstrates good understanding of the uncertainty associated with each datum.</td>
<td>Proposes methodology for data collection, yet has an incomplete understanding of the uncertainty associated with data. Shows little understanding of project.</td>
<td>Does not work independently and has not demonstrated an understanding of the project or data uncertainty.</td>
</tr>
<tr>
<td><strong>Identify, define and deal with ethical issues that arise from conducting research</strong></td>
<td>Identifies ethical issues regarding the proposed research. Makes sure that all issues are addressed and resolved within the research proposal design as well as within the progress reports as well as the final report</td>
<td>Identifies most ethical issues regarding the proposed research. Most of the time the student makes sure that issues are addressed and resolved within the research proposal design as well as within the progress reports as well as the final report.</td>
<td>Student loosely identifies or addresses ethical issues regarding the proposed research within the research proposal design as well as within the progress reports as well as the final report.</td>
<td>Student ignores ethical issues regarding the proposed research within the research proposal design as well as within the progress reports as well as the final report.</td>
</tr>
<tr>
<td><strong>Demonstrate the ability to communicate effectively orally and in written form</strong></td>
<td>Presents a clear, structured, and illustrated written and oral progress report that demonstrates an excellent understanding of the “scientific method” in the context of the project.</td>
<td>Presents a clear and illustrated written and oral progress report that demonstrates a good understanding of the “scientific method” in the context of the project.</td>
<td>Presents a satisfactory written and oral progress report that demonstrates some contextual use of the “scientific method”.</td>
<td>Failure to meet satisfactory written and oral requirements.</td>
</tr>
<tr>
<td></td>
<td>Submits a typed, structured, and coherent scientific report including context, aims, methods, new data, discussion,</td>
<td>Submits a typed and structured scientific report including context, aims, methods, new data, discussion,</td>
<td>Submits a typed and structured scientific report that makes justified conclusions based on data.</td>
<td>A short report with little detail or no report submitted.</td>
</tr>
</tbody>
</table>
**Day to Day While on Sabbatical**

During the sabbatical time most days were spent doing research. In regards to the recruitment of women into STEM programs, the best materials are in [www.ncwit.org](http://www.ncwit.org). They have the virtue of approaching and appealing to women from many different angles. I began working on this by re-decorating our assigned classrooms (BS-105, BS-106 and BS-107). They now have posters depicting women performing computer science activities. Also, our recruiting materials are much more inclusive and we make sure to do the same with all our speakers.

I regularly attend the “Professional Women’s Network” luncheons to network with other professional women. This is a great way to gather success stories to motivate our students to succeed, and to learn about what skills are in demand in our community. In this case it is particularly useful because most of the attendees are women.

I continue to be an active member of [Latinas in Computing](http://latinasincomputing.org/members/) and continue to mentor young Latinas in the mainland via email and social media. This experience enriches my mentoring skills, which I use to help our compute science students. It is very helpful to pass on success stories.

[http://latinasincomputing.org/members/](http://latinasincomputing.org/members/)