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Benjamin J.F. Cruz <senator@senatorbjcruz.com>

Re: Board reporting requirements Part 2

2 messages

Ms. LOUISE MCINTYRE TOVES <lmtoves@triton.uog.edu> Fri, Feb 24, 2017 at 3:54 PM
To: Christine Mabayag <ckamm@triton.uog.edu>, "Flora A. Weilbacher" <flora.weilbacher@guam.gov>, "sandra.miller@guam.gov" <sandra.miller@guam.gov>, "Orleen@SenatorBJCruz.com" <Orleen@senatorbjcruz.com>
Cc: Victorina Renacia <vrenacia@triton.uog.edu>, Jonas Macapinlac <jmac@triton.uog.edu>, "senator@senatorbjcruz.com" <senator@senatorbjcruz.com>

Hafa Adai,

Please find the attached the Boardbook (Part 2) for the February 16, 2017 University of Guam Board of Regents regular meeting, submitted in compliance with PL 31-233.

Speaker Benjamin J.F. Cruz
FEB 28 2017
Time: 2:15 ( ) AM ( ) PM File No.
Received By:
GL-34-17-243

2017 FEB 28 PM 4:02

These are the attachments for BOR Resolution 17-01.

Should you have any questions, please do not hesitate to contact me. Thank you, Louise

Louise M. Toves
Special Assistant
Office of the President
(671) 735-2995; fax (671) 734-2296

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Benjamin J.F. Cruz <senator@senatorbjcruz.com> Tue, Feb 28, 2017 at 3:06 PM
To: Guam Legislature Clerks <clerks@guamlegislature.org>
Cc: "<rennae@guamlegislature.org>" <rennae@guamlegislature.org>, BENJAMIN CRUZ <speaker@senatorbjcruz.com>

02/24/2017	02/16/2017	UNIVERSITY OF GUAM	Board of Regents Regular Meeting; Attachments for BOR Resolution 17-01	34-17-243

[Quoted text hidden]

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Speaker Benjamin J.F. Cruz
I Mina'trentai Kuåttro Na Liheslaturan Guåhan
T 671-477-2520 | F 671-477-2522
http://www.senatorbjcruz.com

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Doc. No. 34GL-17-0243.

December 2015

REQUEST FOR APPROVAL OF A NEW DEGREE PROGRAM

MASTER OF SCIENCE IN SUSTAINABLE AGRICULTURE, FOOD AND NATURAL RESOURCES



COLLEGE OF NATURAL AND APPLIED SCIENCES

THE UNIVERSITY OF GUAM

Cover letter

Master of Science in Sustainable Agriculture, Food and Natural Resources

Rationale for the program

The Academic Program Section (APS), Board on Agriculture Assembly (BAA) of the Association of Public Land-Grant Universities (APLU), in its May 2009 report, indicated that fewer students are pursuing Agriculture related sciences in higher education than is required to meet future needs, especially to provide worldwide leadership. The report also stated "Agriculture in the 21st century faces important environmental, social, agronomic, and philosophical challenges. These challenges are interconnected and can be addressed using an interdisciplinary approach". As the Guam's only Land-Grant institution, UOG has the utmost responsibility to offer this visionary graduate program to lead the Western Pacific Region in meeting the challenges of the 21st century in sustainable agriculture, with innovative research in island sustainability, child and adult obesity, cancer research, interdisciplinary teaching and outreach programs.

Sustainability of the program

In considering a new program, the long-term sustainability of the program should be considered. Several aspects of the program that are of particular importance include; student/enrollment sustainability, programmatic resource sustainability, and relevance to both existing UOG programs and objectives, and the human resource needs of the community UOG serves. This Agriculture, Food and Natural Resources program was designed to be sustainable in all of these areas with its large pool of potential students, grant based assistantships, reliance on existing faculty (no new positions needed), leveraging of existing graduate courses, and regular programmatic planning based on program faculty members federally mandated continuous community needs assessments. In the early stages of development of this program UOG alumni and upper division students were survey on their interests in this and related graduate programs. The information from these efforts was used in the development of this program. A direct measure of this program's relevance and sustainability is in the included signup sheet of 37 UOG students and 47 Guam residents who petitioned for this program and indicated interest in enrolling once it is approved.

An additional indicator of student sustainability is in the monetary support the program can provide to its graduate students. The program faculty members are primarily drawn from the UOG Cooperative Extension and Agriculture Experiment Station faculty. These two programs, for decades, are consistently among the most productive in terms of awarded grants (over $ 4 million in the last five years as shown in Appendix 7). At any given time over 70% of the program's faculty manage awarded grants that can support at least one, ½ time graduate student employee each. The program faculty members have consistently expressed the need for graduate students in Agriculture, Food and Natural Resources to work under our grants. This program can easily support 5 or more ½ time graduate student assistantships just from the decades' long, consistent flow of grant funds generated by the program faculty members.

Strength of the program

- This program is funded in part by CariPac (Caribbean and Pacific Consortium), a federally funded program, and will have a minimum impact on the financial status of the university of Guam.
- This program is unique because no other graduate program at UOG addresses food, nutrition and health issues, or management of agricultural and natural resources.
- The proposed program is built on a foundation of eighty percent of pre-existing courses at UOG and does not require additional faculty in the initial stage.
- Applicant pool consists of bachelor degree from the following programs: consumer and family science with or without minor in nutrition; health science; tropical agriculture; biology; education; and business.
- The job outlook is optimistic as potential employers such as the Department of Agriculture, the Department of Public Health and Social Services, the Natural Conservation Service of the USDA, the Forestry Service, the University of Guam Cooperative Extension Service, College of Micronesia, Palau Community College, Northern Marianas College, American Samoa Community College and Natural Resources and the private sector have supported the program.
- The proposal offers a Certificate Program tailored to the need of students and employers.
- This program will include online and hybrid courses and strengthen UOG's distance education goal.
- The program will increase the research capacity of the University of Guam where graduate students will be involved in a wide range of research topics from island sustainability to obesity and cancer research.
- This program fits with the overall University goal of island sustainability.
- This program is in line with UOG moving from Good to Great.

Oficina del Decano Asociado
Facultad de Ciencias Agrícolas
Universidad de Puerto Rico
Recinto Universitario de Mayagüez

Associate Dean's Office
Faculty of Agricultural Sciences
University of Puerto Rico
Mayagüez Campus

May 16, 2014

Dr. Lee Yudin
Dean
College of Natural and Applied Sciences
University of Guam

Dear doctor Yudin:

I am including some comments and recommendations in relation to UOG's proposal for a creation of a new degree program in M.S. in Sustainable Agriculture, Food and Natural Resources. I am including, Dr. Gladys M. Gonzalez, Dr. David Sotomayor and my comments. Some of my comments/ recommendations are based on my experience working with guidelines for the creation of new academic programs at the UPR and may not apply to your institution.

Dra. Gladys M. González (Acting Dean and Director, College of Agricultural Sciences) comments:

A. Strengths
   1. The program proposes a Multi/trans disciplinary approach
   2. It includes a certificate in international agriculture (MOU is needed with collaborating institutions)
   3. Includes many areas of study of the students: nutrition, health, food security, social economic, etc.

B. Weaknesses
   a. Courses in the areas of Environmental Economics, Natural Resources Economics and Ecological Economics are lacking

Dr. David Sotomayor (He has a strong line of research in N and P impacts on surface water resources in PR and teaches courses in Soil Science and Soil Fertility and Fertilizers) **comments:**

Title of the proposal does not reflect the specialization options which are: Agriculture and Natural Resources; and 2) Food and Nutrition. A suggested title would be "Master of Science in Agriculture, Food and Nutrition" not "Sustainable Agriculture, Food and Natural Resources"

Participants of the proposal all have Ph.Ds, which is very positive.

Section 1.5. Suggestion to edit.

The Track in Agriculture and Natural Resources prepares students for career such as agro-forestry, natural resource management, ~~sustainable~~ agricultural consultant, environmental impact assessor, farm manager, ~~organic~~ farm advisor.
The concept of sustainable and organic should not be included. It is expected that throughout the program, in all practices and courses, sustainable practices be taught and promoted. Further, the promotion of a specific farming practice such as "organic farming" is not in the best interests towards promoting objective, factual and science-based information and towards promoting critical thinking skills.

Section1.5a, p. 4 subjects to be covered.

There are a number of topics that will be covered in the track of Agriculture and Natural Resources. What are "Tracks"? Are these major study areas, courses, minors? Further, these topics (as stated) are not clear in the sense of what they represent. I would suggest that these topics be re-written.

Section 1.6, p. 6. If a minimum number of credits are to be required a specific value must be provided (i.e. it is either 15 or 16, but not both). In the minimum credit category, there are only three courses that (based on the title) are directly related to agricultural issues. Also, in the electives section, there are no agricultural related courses. Thus it seems that students will benefit from an improved number of course offerings that deal with agricultural production of crops and animals.

My comments (Dr. Angel L. González, Acting Associate Dean for Academic Programs):

I think the curriculum is well structured from an academic standpoint and will offer students the opportunity to choice from two specializations (called tracks in the proposal) or a 15-credits certificate.

The program has an interdisciplinary approach, which pulls together diverse areas of sciences and technology; has faculty with the highest academic degree and appropriate laboratory/research facilities. It opens advance study opportunities for students in the undergraduate programs at UOG and from other higher education institutions in the Pacific. It also provides collaboration opportunities with institutions of higher education in other countries. The approval and implementation of the proposed Master of Science in Sustainable Agriculture, Food and Natural Resources at UOG will strengthen its graduate and undergraduate education and provide the critical mass of professionals in food, agriculture and related sciences needed to cope with 21th century challenges in these areas.

Some recommendations to improve the document:

1. Needs a Table of Contents.
2. Needs an introduction and justification of the Program that includes a brief description of the Program, academic reasons to establish this Program, its pertinence to Guam and adjacent areas in the Pacific, demand for the program and employment opportunities for graduates. This should be located at the beginning of the document.
3. Page 2, 1.5: The overall objectives of the program seemed to me like a general profile expected of the graduates.
4. In page 3 and others in the document you have orphan sentences or sections. Should be moved to next page.
5. Page 5-6, 1.5d, specific career preparation practices to be mastered; it looks to me you included some general skills that are expected for professions requiring a master level education. In this section, include those specific practices unique for each of your tracks or certificate separately.
6. Page 10 Effectiveness of the program: this is a very important section and should be more specific; this is your evaluation plan and should be at the end of the proposal. In this section you should include who is responsible to do the evaluation; include how you measure the quality of students, retention and graduation rates, publication in scientific journals, participation in local and international scientific conferences, employment rates, students satisfaction with the Program, employer satisfaction with graduates.
7. Page 16, 3.5- here you should have a table indicating your projections for the first five years of the Program, for example;

Table___. Projections of new admissions, total number of students, and number of graduates for the first five years.

Year	Admissions	Total	Graduates
1	15	15	0
2	15	30	?
3	15	?	?
4	15	?	?
5	15	?	?

You may separate M.S. graduates from Certificate.

8. I did not find any specific requirements for admissions to the Program, neither any reference to graduate programs general academic regulations.
9. I did not find the specific requirements for the degree (Thesis defense, Seminar, maximum number of years to complete, etc.)
10. I did not find how the Program will be administered (Program coordinator, graduate school director).
11. I did not find any budget required to run the Program.

I hope these comments and recommendations help you improve your proposal.

Cordially,

Ángel L. González, Ph.D.
Acting Associate Dean for Academic Programs

Response to Comments/Recommendations from the University of Puerto Rico

1. **Dr. Gladys M. Gonzalez**
   - A. Strengths
   - B. Weaknesses
     a. Courses in Environmental Economics, Natural Resources Economics and Ecological Economics are lacking

     b. *Response: We have added EV 512: Environmental Science: Economics/Management/Law to the Track in Agriculture and Natural Resources*

2. **Dr. David Sotomayor**

   Title Comment: A suggested title would be: "Master of Science in Agriculture, Food and Nutrition" not "Sustainable Agriculture, Food and Natural Resources"

   Response: This program is modeled after the program from Iowa State University, Ames, Iowa, which is called "Master's in Sustainable Agriculture". We want to put more emphasis on "Sustainability", which is an area needed for Island economies and survival in the Western Pacific, and provides originality for our program. The choice to include "Sustainable" in naming the Program is reflected in the philosophy that the program conveys and is the result of a consensus from the faculty responsible for drafting the proposed program.

   Section 1.5: Remove ....."sustainable"....."organic"

   Response: "Sustainable" and "organic" have been removed from the sentence (page 2, 1.5)

   Section 1.5a p.4 subjects to be covered; What are "Tracks"? Are these major study areas, courses, and minors? Further, these topics are not clear in the sense of what they represent. I would suggest that these topics be re-written.

   Response: Tracks are used here to differentiate between two areas of concentration that represent different focus areas in Agriculture and Food and Nutrition. Section 1.5a provides specific courses that cover subject matter as described in the new course outlines.

   Section 1.6, p.6. It is either 15 or 16 credits, but not both. Also in the electives section, there are no agricultural related courses.

Response: Credit numbers have been determined as 13 from core, 14 from each track and 6 from electives. We have removed the "or" option.
We have added AG 481G: Environmental Soil Science and AG451G: Agriculture & Natural Resource Management to the list of electives. Most courses in the Agriculture Track referred to "AL" are also Agriculture courses such as: AL 566: Agro-Ecology for Island Sustainability; AL 570: Sustainable Animal production Systems and AL 581: Plant Nutrition and Soil Fertility.

3. Dr. Angel Gonzalez

A. Strengths
B. Recommendations
   1. Table of Contents

Response: The document sent for review did not include the Table of Contents. There is a Table of Contents included in the final document.

2. Needs a introduction and justification of the Program

Response: We have added an introduction in the form of a "Cover Letter" to address recommendations of reviewer

3. Page 2, 1.5: The overall objectives of the program seemed to me like a general profile expected of the graduates

Response: Indeed these objectives are expected from the graduates and are reflected in the Program Learning Outcomes of the Division of Agriculture and Life Sciences.

4. Page 3 and others: orphan sentences or sections. Should be moved to next page.

Response: Orphan sentences and sections have been moved to next page.

5. Page 5-6, 1.5d, specific career preparation practices to be mastered.... Include specific practices unique for each of your tracks or certificate separately

Response: 1.5d: Practices have been specified and expanded from three (3) to five (5) for the Track in Agriculture and

from three (3) to four (4) for the Track in Food & Nutrition (page 5 and 6)

6. Page 10: Effectiveness of the program: Should be more specific and should be at the end of the proposal. Who is responsible to do the evaluation?

Response: Methods of assessment of the program have been added and expanded.
The relative position of this paragraph follows the guidelines of the University of Guam proposal for new programs.
The Agriculture and Life Sciences' Program Chair will administer the Program (page 10, 1.10)

7. Page 16, 3.5: Here you should have a Table indicating your projections for the first five years of the program.

Response: A Table has been added to satisfy this recommendation on page 15, 3.5.

8. Specific requirements for Admissions to the Program and reference to graduate program general academic regulations.

Response: The requirements are on page 9 and 10, 1.10.

9. Specific requirements such as Thesis, Seminars?

Response: Thesis and Seminars are incorporated into the Core Courses on page 6, 1.6.

10. How the Program will be administered?

Response: The Agriculture and Life Sciences' Program Chair will administer the program (page 10, 1.10)

11. Budget required to run the Program?

The template does not require a budget at this stage. However section 4.9 (page 21) addresses special classrooms, laboratories and capital outlay facilities.

REQUEST FOR APPROVAL OF A NEW DEGREE PROGRAM
MASTER OF SCIENCE IN SUSTAINABLE AGRICULTURE, FOOD AND NATURAL RESOURCES

Table of Contents

1.	Definition of the Proposed Program	1
1.1	Full and exact designation	1
1.2	Name of the college submitting the request	1
1.3	Name of the department, department's division, or other unit of the college which would offer the proposed program	1
1.4	Name, title and rank of the individual primarily responsible for drafting the proposed program	1
1.5	Goals and objectives of the proposed program	2
1.5a	Specify the subject matter to be covered	3
1.5b	Specify the intellectual skills and learning methods to be acquired	3
1.5c	Specify the affective capabilities to be developed	5
1.5d	Specify, if relevant, the specific career-preparation practices to be mastered	5
1.6	List of all courses	6
1.7	Clarification of number and types of electives	7
1.8	Special option: Non-thesis certificate program	7
1.9	Justification of any unusual characteristics	9
1.10	Prerequisites and criteria for admission of students	10
1.11	Evidence that degree program has a coherent design	10
1.12	Describe how educational effectiveness of program is to be measured	10
2.	Context of the Proposed Program	11
2.1	Examples of colleges offering the proposed program	11
2.2	Endorsements from university or community elements	11
2.3	Differences of the proposed program, if any, from similar programs in other institutions	11
2.4	Relation of the proposed program to the total educational program of the respective college	11
2.5	Relation of the proposed program to the planned curricular development of the respective instructional area	12
2.6	List other programs currently offered which are closely related to the proposed program	12
2.7	Explanation of how the needs to be met by the proposed program have previously been satisfied	12
2.8	Applicability of course work taken under the proposed program to other programs currently offered	13
2.9	Assurance that courses and programs are planned both for optimal learniug and accessible scheduling	13

Table of Contents (continued)

3.	Need for the Proposed Program	13
3.1	Primary reason for requesting the proposed program	13
3.2	Professional nses of the program	14
3.3	Results of a survey of serious interest in enrolling under the proposed program	14
3.4	Enrollment figures during the past two years	15
3.5	Estimate the number of students completing the proposed program	15
3.6	Total FTE lower division and upper division	16
3.7	Advantages to the college of offering the proposed program	17
4.	Resources for the Proposed Program	18
4.1	List of all present faculty members	18
4.2	Number and types of additional faculty and other staff positions	18
4.3	Estimate of additional faculty and other staff positions needed	18
4.4	List of courses now offered	19
4.5	List of additional courses not now offered	20
4.6	University library resources	20
4.7	Plans for developing university library resources	21
4.8	Other instructional materials, if any, needed in support of the proposed program	21
4.9	Special classrooms, laboratories and other capital outlay facilities	22

Appendix 1: Letters of Support and Petition

Appendix 2: Course Schedule

Appendix 3: Student Survey Results

Appendix 4: Faculty Curriculum Vitae

Appendix 5: New Course Request/Syllabi

Appendix 6: Other Forms

Appendix 7: Grauts Awarded in the last five years

10.27.15

Request for Approval of a New Degree Program:
M.S. in Sustainable Agriculture, Food and Natural Resources

Master of Science in Sustainable Agriculture, Food and Natural Resources Proposal

1. *Definition of the proposed program.*

1.1 *Full and exact designation for the proposed program.*

The program will be called "Master of Science in Sustainable Agriculture, Food and Natural Resources." Students will have the option to specialize in one of two tracks: 1) Agriculture and Natural Resources or 2) Food aud Nutrition.

1.2 *Name of college submitting the request.*

College of Natural and Applied Sciences (CNAS)

1.3 *Name of the department, department's division, or other unit of the college which would offer the proposed program.*

Agriculture and Life Sciences Division

1.4 *Name, title and rank of the individuals primarily responsible for drafting the proposed program.*

Aflague, Tanisha Ann, Ph.D., Assistant Professor, Human Nutrition
Barber, Robert, Ph.D., Professor/Extension Specialist, Agricultural Economics
Blas, Andrea, Ph.D., Assistant Professor, Plant Pathology
Diambra Odi, Hauhouot, Ph.D., Associate Professor, Animal Science/Nutrition
Ghosh, Shubir, Ph.D., Professor, Biochemistry and Biotechnology
Golabi, Mohammad, Ph.D., Professor, Soil Science
Gong, Hui, Ph.D., Associate Professor, Aquaculture and Molecular Biology
King, Romina, P.D., Assistant Professor, Geography
Leon Guerrero, Rachael, Ph.D., Professor/ Extension Specialist, Human Nutrition
Marutani, Mari, Ph.D., Professor, Horticulture and Sustainable Agriculture
McConnell, James, Ph.D., Professor, Horticulture
Paulino, Yvette C., Ph.D., Assistant Professor, Health Sciences
Schlub, Robert, Ph.D., Professor/Extension Specialist, Plant Pathology
Schwab, Gerhard, Ph.D., Professor, Social Sciences
Singh, Prem, Ph.D., Assistant Professor, Agricultural Engineering
Vuki, Maika, Ph.D., Professor, Chemistry
Yang, Jian, Ph.D., Professor/ Extension Agent IV, Food Science

1.5 Goals and Objectives of the proposed program.

Agriculture and Life Sciences Division within College of Natural Applied Sciences will offer the Master of Science in Sustainable Agricnlture, Food and Natural Resources Program with two tracks to create leaders and professionals for next generation needed to address challenges of food security, human health, energy security and climate change which are closely tied to the global food and agriculture enterprise. The goal of the program will include educating students and developing and disseminating science-based information to promote sustainable agricultural production, healthy living, and natural resource management that is appropriate for the Western Pacific Region.

The Track in Agriculture and Natural Resources prepares students for career such as agro-forestry, natural resource management, agricultural consultant, environmental impact assessor, farm manager, and farm advisor.

The Track in Food and Nutrition prepares students for professional employment or an advanced degree in fields related to public health, nutrition, food safety and sanitation, and related prevention and control programs.

The overall objectives of the graduate program are:

(1) Graduates will be able to apply TECHNICAL KNOWLEDGE and skills necessary to solve problems in sustaiuable agriculture, food and natural resources.

(2) Graduates will be able to use PROFESSIONAL AND COMMUNICATION SKILLS (both written and oral) necessary to foster an integrated and interdisciplinary approach in sustainable agriculture, food and natural resources.

(3) Graduates will be able to assess and apply appropriate TECHNOLOGIES to agriculture, food and natural resources.

(4) Graduates will be effective and productive citizens and life-long learners in a global society, with a HOLISTIC PERSPECTIVE OF FOOD and AGRICULTURE.

(5) Graduates will be able to integrate ETHICAL principles, professional knowledge aud team work in addressing current agricultural, food and natural resource issues.

(6) Graduates will be able to contribute to the improvement and/or maintenance of the QUALITY OF LIFE of individuals, families and diverse communities in Guam, the Western Pacific region and the world.

(7) Graduates will be able to apply RESEARCH SKILLS in designing, collecting, organizing, analyzing, interpreting aud communicating

quantitative and qualitative data in agricultural science, food science and natural resources.

1.5.a Specify the subject matter to be covered.

The following topics will be covered in the Track of Agriculture and Natural Resources

- Evaluation methods of plant, soil and natural resources interaction
- Technologies in sustainable agriculture and agro-ecosystem
- Method of selection of plants adapted to environments
- Plant materials in tropical urban landscape and farmscape
- Evolving methods of engineering technologies in tropical sustainable agriculture
- Effects of soil fertility on plant nutrition and metabolism
- Experimental designs in agricultural field and laboratory
- Sustainable animal production systems
- Agricultural biotechnology
- Tropical aquaculture

The following topics will be covered in the Track of Food and Nutrition

- Applications and issues related to nutrition research
- Dietary assessment methods; nutrition monitoring and surveillance
- Evolving methods of assessing health status
- Assessment and treatment of nutritional health risks
- Health promotion and disease prevention theories and guidelines
- Influence of socioeconomic, cultural and psychological factors on food and nutrition behavior
- Food safety issues, solutions, and regulations
- Food security and value-added food products
- Nutraceuticals and functional foods
- Changes of food quality and components during processing and storage
- Methods of detecting and characterizing microbes and food components.

1.5.b Specify the intellectual skills and learning methods to be acquired.

The students will gain knowledge and understanding of agriculture, food and natural resources concepts. The ability to apply, analyze, synthesize and evaluate issues in the areas of sustainable agriculture, food, nutrition and natural

resources will then be developed. These skills will be acquired by first requiring the learning of facts, theories and basic material which will be put together in

order to understand concepts. Once there is understanding of concepts, students will be asked to solve problems, analyze situations and evaluate alternatives and their consequences. The students will be taught how to conduct, analyze, and then interpret research. The students will also be taught in individual, group and cooperative learning situations.

Students in the Track of Agriculture and Natural Resources will be able to:

- Discuss the connections among all three components of sustainability: social, environmental and economical
- Show ability to integrate cropping system components, such as plant growth and development, soil fertility and structure, and pest management
- Analyze the prospects and challenges of biotechnologies in the future of plants and farm animals
- Identify nutrient management practices, including the use of fertilizers and soil amendments that maximizes plant nutrient uptake and enhance plant health and higher crop productivity
- Analyze the interaction and integration of crops and livestock system components in a sustainable environment
- Develop an agro-ecosystem considering biological and social factors
- Explain the importance of animal agriculture and aquaculture and their impact on natural resource management
- Apply sustainable engineering technologies related to tropical agriculture to strive for eco-frieudly production
- Analyze the role of public policy and apply decision making processes in agricultural, euvironmental and natural resource management systems

Students in the Track of Food and Nutrition will be able to:

- Calculate aud/or define diets for health couditions
- Collect pertinent information for comprehensive nutrition assessments
- Determine nutrieut requirement across the lifespan
- Measure, calculate and interpret body composition data
- Apply food science knowledge to functions of ingredients in food
- Describe effective management skills that enable public health nutrition professionals to perform services
- Analyze and interpret current nutrition research
- Apply general biochemistry and chemistry concepts to food technology
- Identify hazards to foodborne illnesses and assess the risk of contaminated foods
- Correlate to the issues of food safety, quality, and human health
- Apply the molecular technologies used in food microbial and chemical analyses

- Apply food safety management tools to eliminate and control hazards in food processing
- Apply food chemistry to analyze food components and quality
- Apply food safety and processing principles to process high-quality food products

1.5.c Specify the affective and creative capabilities to be developed.

Affective and creative capabilities to be developed in students taking the Master of Science in Sustainable Agriculture, Food and Natural Resources will be important in their professions. The affective capabilities to be developed are:

- Identification or clarification of values
- Development of appreciation and empathy
- Motivation of self and others; and acquisition of respect for diversity.

The creative capabilities to be developed are:

- Oral, written, non-verbal and listening communication skills
- Organizational skills
- Ability to revise and modify
- Analysis and interpretation
- Mentorships
- The skills to empower creativity in others.

1.5.d Specify, if relevant, the specific career-preparation practices to be mastered.

All of the following career preparation practices will apply to the diverse cultures of Guam and the Western Pacific. The many different population groups of this region and the unique environment will be emphasized. Students will gain literacy in computer skills, writing proficiency and the ability to conduct research and outreach projects. Career-preparation skills to be mastered are summarized for each concentration below.

Track in Agriculture and Natural Resources

Students completing the Track in Agriculture and Natural Resources will have mastered the following skills in the field:

- To explain the social impact of agricultural development; to acquire expertise in sustainable agriculture.
- To work interdependently and collaboratively and gain holistic perspective of agriculture and natural resources.
- To develop strong professional and communication skills.
- To be able to make decisions to develop sustainable agriculture system

- To integrate thinking locally, regionally and globally concerning agriculture and the environment

Track in Food and Nutrition

Students completing the Track in Food and Nutrition will have mastered the following skills in the field:

- To develop strong professional and communication skills in nutrition counseling.
- To develop analytical and critical skills in food safety.
- To be lifelong learners with a holistic perspective of food and nutrition.
- To be resourceful and acquire technical knowledge in food and nutrition.
- To be able to interpret assessment for child obesity and children at risk

1.6 List of all courses, by catalog number, title and units of credit to be required for a major under the proposed program.

Core Courses (All Tracks)		
AL 691	Seminar and Current Topics (New)	1 credit
BI/EV 503	Biological Literature & Scientific Writing	2 credits
BI/EV 507	Advanced Statistics	4 credits
AL 695	Thesis (New)	6 credits
	Total:	13 credits

Track in Agriculture and Natural Resources (choose 14 credits minimum)

AG 443G	Sustainable Engineering Technologies	4 credits
EV 512	Environmental Sc.: Econ. /Management/Law	3 credits
EV/AL 561	Urban Landscape Management	3 credits
AL 566	Agro-ecology for Island Sustainability (New)	3 credits
AL 570	Sustainable Animal Production Systems (New)	4 credits
AL 581	Plant Nutrition and Soil Fertility (New)	3 credits
BI 594	Advances in Sustainable Aquaculture	3 credits

Track in Food and Nutrition (choose 14 credits minimum)

BI/CH 419 G	Biochemistry	4 credits
CF 430G	Nutrition Throughout the Lifespan	3 credits
CF 445G	Food Chemistry	4 credits
CF 460G	Advanced Nutrition	3 credits
AL 542	Advanced Food Safety (NEW)	3 credits
AL 505	Nutritional Epidemiology (NEW)	3 credits
AL 539	Public Health Nutrition (NEW)	3 credits

1.7 Clarification of number and types of electives, if any, under the proposed program, including special options.

Students are to choose a minimum of six credits from another track or from the following Electives:

AG481G	Environmental Soil Science	4 credits
AG 451G	Agri. & Natural Resource Management	3 credits
MI 501	Peoples and Cultures of Micronesia	3 credits
EV 513	Environmental Impact Assessment	2 credits
EV 535	Tropical climate and Climate Variability	3 credits
EV/BI 545	Fisheries Biology	4 credits
EV 563	Management and Recycling of Organic Waste	3 credits
SW 690	Social Action/Intervention Research	3 credits
HS 405G	Epidemiology	3 credits
HS 416G	Research in Health science	3 credits
BI 425G	Molecular Biology	5 credits
HS 491G	Current Topics	3 credits
MI 514	Health and Human Adaptation in Micronesia	3 credits
AL 698	Internship (New)	3 credits
AL 696	Teaching/Research Assistantship (New)	1 credit

Students are required to take a minimum of 34 credits to graduate from the program. A thesis with a satisfactory grade point average of 3.0 or higher will confer the Master of Science in Sustainable Agriculture, Food and Natural Resources.

1.8 Special Option: Non-Thesis Certificate Program

A non-thesis track is possible where a graduate certificate may be issued with a minimum of 15 credits from one of the two tracks.

Graduate Certificate program
The Graduate Program in Sustainable Agriculture, Food and Natural Resources offers a Graduate Certificate in different concentration to students who have completed successfully a total of 15 credit hours with a satisfactory grade point average of 3.0 or higher. The requirements are:

i. Program Course Requirement for all concentrations

AL691 Seminar and Current Topics (1 credit) F/S	1

ii. Concentration Course Requirements
Selection of courses for the student's concentration will be determined by the Student, Advisor and one additional committee member of the program, and

approved by the Dean of the College and the Dean of the Graduate School. Examples of Graduate Certificate program with specific concentration are listed below.

Examples:

a. ***Graduate Certificate in Island Sustainability***
--Select a minimum of **14 credits** from the followings:

AL 566 Agroecology for Island Sustainability	3
AL 570 Sustainable Animal Production Systems	4
AL/BI594 Advances in Sustainable Aquaculture	3
AL 698 Internship	3
AL 690 Special Project in Island Sustainability	1-3
MI 501 Peoples and Cultures of Micronesia	3
MI/EV 517 Cultural Ecology	3
EV 563 Management and Recycling of Organic Wastes	3
MI 520 Economic Development and Change in Micronesia	3

b. ***Graduate Certificate in International Agriculture***
--Select a minimum of **14 credits** from the followings:

AL 566 Agroecology for Island Sustainability	3
AL 570 Sustainable Animal Production Systems	4
AL 698 Internship (off-island study)*	3
AL 690 Special Project in International Agriculture	1-3
AL/BI594 Advances in Sustainable Aquaculture	3
One Graduate course in global or regional study (eg. MI 501)	3 or 4

*Possible study sites for the Graduate Certificate in International Agriculture are:

- University of the Ryukyus, Okinawa (Japan)
- Okayama University, Okayama (Japan)
- Kagoshima University, Kagoshima (Japan)
- Tokyo University of Agriculture, Tokyo (Japan)
- University of Puerto Rico (Puerto Rico)
- The World Vegetable Center, Tainan (Taiwan)
- University of the Philippines Los Baños College, Laguna (Philippines)
- Kasetsart University (Thailand)
- Other university and locations where UOG has MOU of research and instruction collaboration.

c. *Graduate Certificate in Agriculture and Natural Resources*
--Select a minimum of **14 credits** from the followings:

AL 566 Agroecology for Island Sustainability	3
AL 561 Urban Landscape Management	3
AL 570 Sustainable Animal Production Systems	4
AL/EV 563 Management and Recycling of Organic Waste	3
AL 443G Sustainable Engineering Technologies	4
BI/AL594 Advances in Sustainable Aquaculture	3
AG 481G Environmental Soil Science	4

d. *Graduate Certificate in Food and Nutrition*
--Select a minimum of **14 credits** from the followings:

BI/CH 419G Biochemistry	4
CF 430G Nutrition Throughout the Lifespan	3
CF 445G Food Chemistry	4
CF 460G Advance Nutrition	3
AL 505 Nutritional Epidemiology	3
AL 539 Public Health Nutrition	3
AL 542 Advanced Food Safety	3

e. *Graduate Certificate in Tropical Horticulture*
-- Select a minimum of **14 credits** from the followings:

AL 561 Urban Landscape Management	3
AL 566 Agroecology for Island Sustainability	3
AL 581 Plant nutrition and Soil Fertility	3
AG481G Environmental Soil Science	4
AL694 Special Project in Tropical Horticulture	3
AL698 Internship in Tropical Horticulture	3

1.9 Justification of any unusual characteristics of the proposed program, e.g., in terminology, units of credit required, types of course work, etc.

Credit requirements for graduation: minimum 33 (Core: 13 credits; Track: 14 credits; Electives: 6 credits).

The flexibility of the Graduate Certificate Program is its major asset. Graduate Certificates can be tailored to the needs of the student, the employer or the community. Professionals may seek enrichment or the addition of some graduate courses to satisfy promotion and tenure in employment, without putting the time and effort for an entire degree program. For that reason, a certificate program is available to address the needs mentioned above, and also to contribute to increased enrollment for the program.

Certificate award: minimum 15 credits (Core: 1 credit; Track: 14 credits)

1.10 Prerequisites and criteria for admission of students to the proposed program, and for their continuation in the program.

Prerequisites and criteria for admission of students shall be the same as for admission to the University, as specified in the Graduate Catalog. Continuation in the program requires that the student maintain a minimum cumulative grade point average (GPA) of 3.0. The Agriculture and Life Sciences' Program Chair will administer the program.

1.11 Evidence that the degree program has a coherent design and is characterized by continuity, sequential progression, and a synthesis of learning.

When designing the Master of Science in Sustainable Agriculture, Food and Natural Resources Program, 'core' courses were selected specifically to bridge both tracks. Prerequisite courses that are specified in any new course under this program provide sequential progression by allowing a student to learn basic skills before attempting more advanced treatment of the subject matter. The graduate courses build on each other, aud students will be encouraged to take the courses in the order, as outlined.

Continuity within the program is achieved by the interrelationship of the goals and objectives of the individual courses. Synthesis of learning is assured by taking skills learned in the classroom and combining them with other educational activities, such as internships, special projects and independent library studies, which are available to the student from other majors within the University of Guam.

1.12 Describe how educational effectiveness of program is to be measured.

The method to be used to measure educational effectiveness of the program will be an annual survey conducted of recent graduates of the program. Graduates will be asked about the nature of their work and their success in enrolling in doctoral programs, as well as their success in obtaining professional employment and the adequacy of the preparation they received at the University of Guam. Employers will be surveyed as well to assess the readiness and effectiveness of our graduates. The results of the survey will provide a valuable feedback for future curriculum adjustment.

2. *Context of the Proposed Program*

2.1 Examples of colleges offering the proposed program.

- Antioch University in Seattle, Washington: Master of Arts and Graduate Certificate in Environmental and Community with specialization in Sustainable Food Systems.
- Iowa State University, Ames, Iowa: Master's Program in Sustainable Agriculture.
- Prescott College, Prescott, Arizona: Ph.D. in Sustainability Education with a focus on Sustainable Food Systems.
- University of California at Santa Cruz: Bachelor and Ph.D. program in Environmental Studies with emphasis on Agroecology and Sustainable Agriculture.
- University of Maine, Orono, Maine: Master of Science and Ph.D. in Plant, Soil and Environmental Sciences with a focus in Sustainable Agriculture.
- Marylhurst University, Marylhurst, Oregon: MBA in Sustainable Business with emphasis on Natural and Organic Resources.
- Green Mountain College: Master's in Sustainable Food Systems.
- Colorado State University, Fort Collins, Colorado: Master's in Integrated Resource Management.

2.2 Endorsements from university or community elements

The letters contained in **Appendix 1** show the community representatives that support the Master of Science in Sustainable Agriculture, Food and Natural Resources.

2.3 Differences of the proposed program, if any, from similar programs in other institutions.

The Graduate Program in Sustainable Agriculture (GPSA) from Iowa State University (ISU) has a lot of similarities with this program in term of contents and objectives. However, the GPSA includes a Ph.D. program and offers the following tracks (called thematic areas): landscape and watershed management; international development and food security; crop and livestock production and protection; policy, governance, and economics; engagement and communication; philosophy, ethics and history. In addition the GPSA program offers a double major and a minor.

2.4 Relation of the proposed program to the total educational program of the respective college.

10.27.15

Request for Approval of a New Degree Program: M.S. in Sustainable Agriculture, Food and Natural Resources

The College of Natural aud Applied Sciences (CNAS) seeks to promote the advancement of regional knowledge through teaching and research. This original research work allows students to be exposed to modern basic and applied research methods, which contributes to the development of critical thinking and technical communication skills, and promotes intellectual understanding and growth. Instructional activities of the faculty of CNAS prepare students for employment opportunities in the military, and in fields of applied and basic sciences, and for continued education in terminal degree research programs and professional schools.
The Master of Science in Sustainable Agriculture, Food and Natural Resources is clearly in accordance with this philosophy.

2.5 *Relation of the proposed program to the planned curricular development of the respective instructional area (department, department's division).*

The Master of Science in Sustainable Agriculture, Food and Natural Resources is a logical extension of the Tropical Agricultural Science Program at the undergraduate level. Candidates for the Master's program will come naturally from students with Bachelor of Science in Tropical Agriculture, and also from other programs such as Consumer and Family Sciences, Biology, Health Sciences, Education and Business.

2.6 *List of other programs currently offered which are closely related to the proposed program.*

Closely related programs include the Master of Science in Biology aud the Master of Science in Environmental Science. However no institution of higher learning on Guam offers a Master of Science in Sustainable Agriculture, Food and Natural Resources at the present time. The impact of food and nutrition in the overall health of island community present specific challenges, especially with chronic diseases such as diabetes and hypertension, and also different forms of cancer, associated with foods and lifestyle.

2.7 *Explanation of how the needs to be met by the proposed program have previously been satisfied.*

Previously, students left the Island for other institutions of higher learning, or enrolled in the Master of Environmental Science Program. Currently, there is no graduate program at the University of Guam that emphasizes sustainable agricultural production, food and nutrition.
There is a shortage of qualified professionals in the field of Food and Nutritiou Science on Guam. To fill some of the need, off-island hires, short-term contracts and people with limited training who have had to learn on the job were hired. Well-trained nutrition scientists are needed. Careers in Sustainable Agriculture and Natural Resource Management also have shortage of qualified professionals

on-island. Well-trained agricultural scientists with a focus on Island sustainability are needed for the Western Pacific.

2.8 *Applicability of course work taken under the proposed program to other programs currently offered.*

Program offered for the Master of Science degree in Sustainable Agriculture, Food and Natural Resources provides elective courses for other Master's programs in Environmental Sciences, Biology, Education and Business Administration at the University of Guam.

2.9 *Assurance that courses and programs are planned both for optimal learning and accessible scheduling, and are offered in a manner that ensures students the opportunity to complete the entire program as announced.*

After consulting the current Graduate Catalog (and Undergraduate Catalog for 'G' courses) to verify which semester specific courses were offered, Recommended Course Schedules are designed so that students can take courses in a logical sequence and complete the masters within two to three years. (See **Appendix 2**). A certain number of the courses will be offered online.

3. *Need for the Proposed Program*

3.1 *Primary reason for requesting the proposed program.*

The Academic Program Section (APS), Board on Agriculture Assembly (BAA) of the Association of Public and Land-Grant Universities (APLU), in its May 2009 report, indicated that fewer students are pursuing agriculturally related sciences in higher education than required to meet future needs, especially to provide worldwide leadership. The report also encouraged students to develop portfolio of skills in collaborative and interdisciplinary approaches, and be able to comprehend increasingly complex systems models across scales with global effects. "Agriculture in the 21st century faces important environmental, social, agronomic, and philosophical challenges. These challenges are interconnected and can be addressed using an interdisciplinary approach".
As the island only land-grant institution, UOG has the utmost responsibility to offer this visionary graduate program to lead the Pacific Region in meeting the challenges of the 21st Century in sustainable agriculture, with innovative research on island sustainability, child and adult obesity, cancer research, interdisciplinary teaching and outreach programs. This new program is built upon existing resources (human and research capabilities) at the University of Guam, and to supplement the research mission of the College of Natural and Applied Sciences. The proposed program is to emphasize an interdisciplinary approach to plant, animal and human and to explore sustainable production systems that minimize the human impact on the environment, maximize food biosecurity and improve

the quality of life of people of the Western Pacific Islands. This program addresses the needs for students to take an eco-friendly approach to crop production and landscape management.

3.2 Professional uses of the proposed program.

Community Health Specialist; Nutrition Education Coordinator; Agricultural Business Development Leader; Ranch Steward; Aquaponics Greenhouse Manager; Food Systems Coordinator; Youth and Adult Education Consultant; Agro-forestry Specialist; Agriculture Coordinator; Organic Farm Manager; Policy Analyst and Community Organizer; Natural Resources Manager; International

Agricultural Development Advisor; Food Science and Technology Specialist; Food Safety Supervisor; Livestock production Manager.

3.3 Results of a survey of serious interest in enrolling under the proposed program.

Two surveys were conducted to determine students' interest in a Master of Science in Sustainable Agriculture, Food and Natural Resources and related subjects during AY 2009-2010, and Fall 2012.

Summary of Survey 2012:

Respondent Major at UOG:
Agriculture: 8%; Consumer & Family Science: 10%; Biology: 10%; Education: 18%; Nursing/Health Science: 18%; Business/Accounting: 6%; English/Communication: 3%; Undeclared/Others: 27%

Learning Experience at UOG:
Excellent: 17%; Good: 53%; Average: 28%; Below Average: 2%; Not Satisfactory: below 1%

Should UOG Offer a Master's in Agriculture?
Strongly Agree: 39%; Agree: 45%; I don't know: 14%; Disagree: 1%; Strongly Disagree: 1%

Interest in Pursuing an Advanced Degree in Agriculture:
Yes: 12%; No: 40%; May be: 26%; I need more info: 22%.

Interest in Master's in Agriculture if Financial Aid or Scholarships are Available:
Yes: 63%; No: 8%; May be: 21%; I need more info: 8%.

Concentration Area of Interest:
Agriculture and Natural Resources: 40%; Food and Nutrition: 56%; Adult Education & Extension: 4%

The complete survey results and analysis are shown in **Appendix 3**

Summary of Survey 2009-10:

The survey was conducted among students enrolled in introductory agriculture, mathematics, language, and consumer & family science (CFS) courses in Fall 2009 and Spring 2010 semesters. The majority of students were taking these courses as GE courses. The total of respondents was 114 students with major of Agriculture (7), Biology (12), Business Administration, (9), CFS (2), Computer Science (5), Criminal Justice (9), Education (21), Health Science (4), Nursing (9), Pre-Engineering (2), Psychology (6), others (9), and Undeclared (19) (**Appendix 3 survey 2009-10**). The **99** students (**86.8%**) either strongly agreed or agreed to offering the Master of Science in Agriculture and Life Science. **Thirty respondents** (**26.3%**) expressed their interest in enrolling or taking graduate courses in Agriculture and Life Sciences.

3.4 Enrollment figures during the past two years in specified courses or programs related to the proposed program, which indicate interest in the proposed program.

Enrollment data are obtained from UOG FACTBOOK 2010 and 2011 (UOG website).

Undergraduate Program, Major	Fall 2010	Fall 2011
Tropical Agricultural Science	10	16
Biology	88	87
Chemistry	5	9
Consumer & Family Science	8	15
Health Sciences	26	73
Total Potential Candidates	137	200

3.5 Estimate of the number of students completing the proposed program in the second year and in the fifth year after its approval.

Estimated number of students completing the program the second year: three. Estimated number of students completing the program the fifth year: eight.

Two years after approval, three to five students are expected to complete the program. Five years after approval, approximately five to eight students are expected to complete the program. This number was based on the number of Consumer and Family Science students (15), Tropical Agricultural Science (16),

Health Science (73), Chemistry (9) and Biology (87) who graduated during the past 4 years (n=200). According to the student survey, we estimate that 5 to 8%

of students who graduate from these undergraduate programs would be interested in the Master of Science in Sustainable Agriculture, Food and Natural Resources.

Projections of new admissions:

Year	Admissions	Total	Graduates
1	5	5	0
2	5	10	3
3	6	13	5
4	6	14	6
5	7	15	8

These estimates are very conservative as 5% of our potential pool of 200 is 10 students.

3.6 *Total FTE lower division and in the upper division, enrollments in the specified department, department's division, or other units of the college which would offer the proposed program, as the current semester and as projected five years hence, further divided into lecture FTE and laboratory FTE where appropriate.*

Current FTE Student Enrollment (Fall 2012 & Spring 2013)

Agriculture Program (Fall 2012): Undergraduate Program
Total Course Enrollment = 92 students; Credit Hour Production = 350; FTE = 29.16
Consumer and Family Science Program (Fall 2012): Undergraduate Program
Total Course Enrollment = 197 students; Credit Hour Production = 638; FTE = 53.16
Total FTE Fall 2012 = 82.32
Agriculture Program (Spring 2013): Undergraduate Program
Total Course Enrollment = 134 students; Credit Hour production = 512; FTE = 42.66
Consumer and Family Science Program (Spring 2013): Undergraduate Program
Total Course Enrollment = 227 students; Credit Hour Production = 681; FTE = 56.75
Total FTE Spring 2013 = 99.41
Total FTE Academic Year Fall 2012-Spring 2013 = 181.73*

*FTE calculations based on 12 credits per semester as equivalent to full-time status for undergraduate students

Projected FTE Student Enrollment (in Five Years)

In five years, the Agriculture and Consumer and Family Science Programs' FTE at the undergraduate level should increase proportionally to overall enrollment at

UOG. This will result in an increase in student enrollment for the Sustainable Agriculture, Food and Natural Resources Program as follows:

Master's Program in Sustainable Agriculture, Food and Natural Resources:
Total Course Enrollment = 15 students; Credit Hour Production = 60; FTE = 6.66

Certificate Program in Sustainable Agriculture, Food and Natural Resources:
Total Course Enrollment = 6 students; Credit Hour Production = 24; FTE = 2.66

Total Predicted FTE in Five Years = 9.32**

** FTE calculations based on 9 credits per semester as equivalent to full-time status for graduate students.

3.7 Advantages to the college of offering the proposed program.

A benefit to the college is the increase of total student enrollment in CNAS. These students would be mainly from Guam, including both civilian and military communities. Additionally, students from Micronesia, Asian and Pacific Rim countries attend the University of Guam.
The addition of a Master of Science in Sustainable Agriculture, Food and Natural Resources addresses one objective of the newly awarded USDA research project, Children's Healthy Living Project for Remote Underserved Populations in the Pacific (CHL), to train professionals in Guam and surrounding islands in areas related to child obesity prevention. **There is no Master of Science program at the University of Guam that addresses food, nutrition, health, or education outreach related to child obesity, preventable chronic diseases and cancer research.** The proposed program integrates these concepts into one degree, and could be offered to students from collaborating CHL sites (American Samoa Community College, College of Micronesia, Northern Marianas College, University of Alaska, and University of Hawaii).
This program is to benefit communities on Guam and Micronesia by addressing food biosecurity and sustainability, and to provide training for personnel in natural resources management.
The CariPac (Caribbean-Pacific Consortium) is a federally funded program which main objective is to increase enrollment and training for agriculture and related fields with participating institutions. The program has been in place at CNAS for over ten years and had contributed to training opportunities that incorporate online course development for Guam and Micronesia and classroom instruction at the University of Guam.

The University of Guam is leading the Western Pacific Region with a broader vision by establishing the Center for Island Sustainability (CIS) and the Cancer Research Institute (CRI), which are to be beneficiaries from this graduate program in regard to research opportunities with graduate students and faculty.

4. *Resources for the Proposed Program*

4.1 List all present faculty members, with rank, highest degree earned, publications and professional experience, which would teach in the proposed program.

Curriculum vitae for each faculty member are presented in **Appendix 4**. A listing of present faculty members follows.

Faculty member, highest degree and rank:

Aflague, Tanisha Ann, Ph.D., Assistant Professor, Human Nutrition
Barber, Robert, Ph.D., Professor/Extension Specialist, Agricultural Economics
Blas, Andrea, Ph.D., Assistant Professor, Plant Pathology
Diambra Odi, Hauhouot, Ph.D., Associate Professor, Animal Science/Nutrition
Ghosh, Shubir, Ph.D., Professor, Biochemistry and Biotechnology
Golabi, Mohammad, Ph.D., Professor, Soil Science
Gong, Hui, Ph.D., Associate Professor, Aquaculture and Molecular Biology
King, Romina, Ph.D., Assistant Professor, Geography
Leon Guerrero, Rachael, Ph.D., Professor/ Extension Specialist, Human Nutrition
Marutani, Mari, Ph.D., Professor, Horticulture and Sustainable Agriculture
McConnell, James, Ph.D., Professor, Horticulture
Paulino, Yvette C., Ph.D., Assistant Professor, Health Sciences
Schlub, Robert, Ph.D., Professor/Extension Specialist, Plant Pathology
Schwab, Gerhard, Ph.D., Professor, Social Sciences
Singh, Prem, Ph.D., Assistant Professor, Agricultural Engineering
Vuki, Maika, Ph.D., Professor, Chemistry
Yang, Jian, Ph.D., Professor/ Extension Agent IV, Food Science

4.2 Number and types of additional faculty and other staff positions, if any, needed to initiate the proposed program.

No additional faculty member is needed to initiate the graduate program, however a research position in animal science has been vacant since the only animal scientist retired from the University of Guam. Since animal science is one of the main components of Sustainable Agriculture, Food and Natural Resources program, it would be beneficial to have this faculty position filled to sustain the proposed program in teaching and research.

4.3 Estimate of additional faculty and other staff positions needed specifically for the proposed program one, two, and five years after its approval.

10.27.15

Request for Approval of a New Degree Program:
M.S. in Sustainable Agriculture, Food and Natural Resources

With anticipation of retiring faculty members within the next three to five years after approval of the Master of Science in Sustainable Agriculture, Food and Natural Resources program, at least two full-time doctoral faculty positions (research/teaching) may be requested to fill critical area identified later in the program.

4.4 List of courses now offered, by catalog number, title and units of credit needed in the proposed program.

The courses are listed as they appear in the UOG 2011-2012 Undergraduate and Graduate Catalog. These courses include:

Program Core (all Tracks):		
BI/EV 503	Biological Literature & Scientific Writing	2 credits
BI/EV 507	Advanced Statistics	4 credits

Track in Agriculture and Natural Resources:		
AG 443G	Sustainable Engineering Technologies	4 credits
EV 512	Environmental Sc.: Econ. /Management/Law	3 credits
EV/AL 561	Urban Landscape Management	3 credits
BI 594	Advances in Sustainable Aquaculture	3 credits

Track in Food and Nutrition:		
BI/CH 419 G	Biochemistry	4 credits
CF 430G	Nutrition Throughout The Lifespan	3 credits
CF 445G	Food Chemistry	4 credits
CF 460G	Advanced Nutrition	3 credits

Students are to choose a minimum of six credits from the following Electives.

Electives:		
AG 451G	Agricultural and Natural Resource Management	3 credits
AG481G	Environmental Soil Science	4 credits
MI 501	Peoples and Cultures of Micronesia	3 credits
EV 513	Environmental Impact Assessment	2 credits
EV 535	Tropical climate and Climate Variability	3 credits
EV/BI 545	Fisheries Biology	4 credit
EV 563	Management and Recycling of Organic Waste	3 credits
SW 690	Social Action/Intervention Research	3 credits
HS 405G	Epidemiology	3 credits
HS 416G	Research in Health science	3 credits
BI 425G	Molecular Biology	5 credits
HS 491G	Current Topics	3 credits
MI 514	Health and Human Adaptation in Micronesia	3 credits

4.5 *List of additional courses not now offered, by catalog number, title and units of credit, needed initially and during the first two years after approval of the program, needed to make the program fully operative.*

New course request forms and syllabi are in **Appendix 5**

AL 691	Current topics in Food and Agriculture	1 credit
AL 695	Thesis	6 credits
AL 698	Internship	3 credits
AL 542	Advanced Food Safety	3 credits
AL 505	Nutritional Epidemiology	3 credits
AL 539	Public Health Nutrition	3 credits
AL 566	Agro-ecology for Island Sustainability	3 credits
AL 570	Sustainable Animal Production Systems	4 credits
AL 581	Plant Nutrition and Soil Fertility	3 credits
AL 692	Teaching/Research Assistantship	1 credit

4.6 *College library resources, available in direct support of the propose program, specified by subject areas, volume count, periodical holdings, etc.*

UOG Library Resources (LRC):
Inter-library loan is available to both students and faculty. Some items can be received at no cost, for others LRC is charged for. Both students and faculty may

designate if they are willing to pay for an item. Here are links to the online for various types of materials:
Periodical Request form
http://rfk2.edu.gu/ill/articleform.php
Book Chapter Request Form
http://rfk2.edu.gu/ill/chapterform.php
Entire Book Request Form
http://rfk2.edu.gu/ill/bookform.php

Databases
The RFK library has access to more EBSCO databases than PREL does but the systems are not interchangeable in that if you store something in a folder on the PREL site you cannot access it from the same database through the UOG. You can reach UOG databases from home if you have your library card up-to-date. You can reach them with the university wi-fi if you have the computer center install the software on your personal computer. You access these by clicking on the "Electronic Journals and Databases" link on the library web page.The LRC has MedlinePlus and PubMed.

Other databases directly related to this field might be:
AgNIC- Agriculture Network Information Center

Ebsco Agricola
GreenFILE

There are also Newspaper databases such as NewsBank which could be helpful

and more general academic data bases such as EBSCO Academic Search Premiere

Because of the multidiscipliuary nature of the Master of Science in Sustainable Agriculture, Food and Natural Resources, a wide variety of library subject classes support the proposed program.

JOURNALS		
LIBRARY Of CONGRESS	SUBJECT AREA	COUNT
GN - GT	Anthropology and Customs	02
LB - LC	Education	237
Q - QR	Science and Nutrition	643
R - RM	Medicine and Health	671
S - SF	Agriculture	251
TJ - TX	Home Economics	299
TOTAL		**3,326**

PERIODICALS		
LIBRARY OF CONGRESS	SUBJECT AREA	COUNT
LB	Education	3
QK - QR	Science and Nutrition	8
R - RT	Medicine and Health	18
S - SF	Agriculture	8
TT - TX	Home Economics	24
TOTAL		**97**

4.7 *Plans for developing college library resources in support of the proposed program during the first five years of operating the program.*

Currently, the library resources are adequate. The College of Natural and Applied Sciences are in progress of Internet accessibility for students in the teaching classroom and research laboratories. However it would be convenient to have a computer lab in the Agriculture and Life Science Building to accommodate students with online courses and bibliographic research.

4.8 *Other instructional materials, if any, needed in support of the proposed program, itemized with cost estimates as projected for the first five years of operating the program.*

The UOG Triton farm at the WPTRC in Yigo is an integrated model farm that includes fish farming, poultry, aquaponics, and vegetables and fruit crops. This is an ideal laboratory for a capstone course in sustainable agriculture.

4.9 *Special classrooms, laboratories and other capital outlay facilities, if any, needed in support of the proposed program, itemized and arranged by dates for the first five years of operating program.*

Current laboratory facilities and classrooms are generally adequate. Additional classroom space is not needed at this time. The Agriculture and Life Science Building, which will house the Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management, contains research laboratories of soil science, horticulture, food/animal science, molecular biology of aquaculture, chemical ecology/entomology, an experimental kitchen, a large lecture room, a teaching laboratory and two small classrooms. Additionally on campus, there are a plant nursery and organic demonstration gardens. In Biology/Chemistry building of College of Natural and Applied Science there are teaching laboratories of chemistry, molecular biology and microbiology.
The off-campus facilities that support the program include: UOG Triton farm (a integrated model farm at the Western Pacific Tropical Research Center (WPTRC) in Yigo) with modules of aquaponics, poultry, vegetables, fruits and ornamental crop productions; the Shrimp and Fish Hatchery in Mangilao; WPTRC in Inarajan/Malojloj and Ija farms.

List of Appendix

Appendix 1: Letters of support and petitions
Appendix 2: Course Schedule
Appendix 3: Student survey results
Appendix 4: Faculty curriculum vitae
Appendix 5: New course requests/syllabi
Appendix 6: Other forms
Appendix 7: Grants Awarded in the last five years

No. 5277a

Faculty Senate Office
University of Guam

Received By:
11/15/2016 12:20 pm
Date & Time

UNIVERSITY OF GUAM
UNIBETSEDÅT GUAHAN

GRADUATE CURRICULA REVIEW COMMITTEE

May 20, 2016

Dr. Mari Marutani
Professor, Horticulture
Western Pacific Tropical Research Center

Dear Dr. Marutani,

The Graduate Curricula Review Committee expresses its gratitude for the meetings we had with the proponents of the Master of Science in Agriculture, Food and Natural Resources (Log No. 5277) in our April 8, 2016 and May 6, 2016 meetings.

The GCRC supports the creation of a new graduate program and to substantiate our report to the Faculty Senate, we would request the following information be included in the report:

1. Is there clear documentation from the community at large that there is a need for this advance program? In the binder, there were letters of support from agency directors but this is not sufficient. Gaps in service or personnel needs, documented survey reports or other data sources are essential. Has the Department of Labor issued any reports indicating the need for this program?

2. Is there clear documentation of an identified student population that has expressed interest or willingness to support the graduate program?

3. Is the student population one that will be sustained over time based on the need within the community?

   *For items 1-3, we suggested in the May 6, 2016 meeting, that a survey be done.

4. Are there qualified faculty to support the proposed program? In the Good to Great, there should be one dedicated FTE to the graduate program.

1

5. The proposed graduate program can also discuss how this will be aligned to the proposed Agriculture and Life Sciences degree program.

6. Where will graduates serve after degree completion? Is the new program going to train new professionals into the field of study or are these people in existing positions in the community who will be a one time student enrollment for the degree program?

We again thank you for your cooperation and inputs in the two meetings. We would request for a response from the program faculty and the Dean prior to submission of our recommendation to the Faculty Senate. All such inputs shall be appended to the program proposal. May we request the additional inputs be forwarded to us before August 31, 2016. The GCRC will present its recommendation for the Master of Science in Agriculture, Food and Natural Resources to the Faculty Senate in Fall 2016.

Sincerely yours,

Dr. Leila C. Kabigting
Interim Chair, GCRC

Cc: Dr. Lee Yudin, Dean/Director
College of Natural and Applied Sciences

No. 5277b

Faculty Senate Office
University of Guam
CM
Received By:
11/15/2016 12:20
Date & Time

UNIVERSITY OF GUAM
UNIBETSET GUAHAN

COLLEGE OF NATURAL & APPLIED SCIENCES

Memorandum

September 29, 2016

To: Dr. Leila C. Kabigting,
Chair, Graduate Curriculum Review Committee, UOG

From: Faculty of proposed MS program in Sustainable Agriculture, Food and Natural Resources

Re: Response to the GCRC Report request for additional 6 questions (May 20, 2016)

Dear Dr. Kabigting and committee members:

Thank you very much for your letter supporting our effort to develop a new graduate program at the University of Guam. The proposed Master's program is "Sustainable Agriculture, Food and Natural Resources," for brevity in this document we refer to the program as SAFNR. We are submitting additional information about the program in response to six questions listed in your letter dated May 20, 2016. Based on your recommendations, we conducted three surveys to answer questions 1, 2 and 3 during this past summer (July 1-August 26, 2016). Below are your original six questions and our responses.

Q1. Is there clear documentation from the community at large that there is a need for this advanced program? In the binder, there were letters of support from agency directors but this is not sufficient. Gaps in service or personnel needs, documented survey reports or other data sources are essential. Has the Department of Labor issued any reports indicating the need for this program?

Response 1:

The new graduate program in SAFNR was developed in response to stakeholders' demands and students' desires. In our original proposal and included again in this response, are supporting letters from College of Micronesia FSM, Guam Department of Public Health and Social Services, and Guam Department of Agriculture. We also submit the results of a student, alumni and stakeholders survey and a petition for creating the new graduate program in SAFNR as supporting documents. The petition shows support from 70 UOG students and alumni as well as 77 individuals from the community at large.

With this memorandum, we submit additional documents indicating a need for this MS program.

- The results of a Stakeholder survey (July 1 – August 26, 2016) (**Attachment A**-1)
- The results of an Alumni survey (July 1 – August 26, 2016) (**Attachment A**-2)

UOG Station, Mangilao, Guam 96923
Telephone: (671) 735-2100/01 Fax: (671) 734-4600
A Land Grant Institution Accredited by the Western Association of Schools and Colleges

- The results of a UOG Student survey (July 1 – August 26, 2016) (Attachment A-3)
- Letter of support from the Guam Northern and Southern Soil Water Conservation Districts (**Attachment B**)
- Occupational Outlook Handbook 2014 (Excerpt) from US Department of Labor publication (**Attachment C**)
- Outlook on Job Opportunity in Agriculture and Natural Resources based on US Census Data and Employer Survey Analysis by the National Association of Colleges and Employers (**Attachment D**)

Stakeholder and Student Needs – Survey Results:

Using SurveyMonkey, we obtained the responses of nine stakeholders (**Attachment A-1**). The majority of the respondents thought the graduate program would benefit their company or agency by providing a higher level of training for potential employees and/or by offering new career advancement opportunities for their current employees (Fig. 1). They also believed that stakeholders in Guam and the Pacific region would benefit from the proposed graduate program. Seven stakeholders expressed their interests in having graduate student interns from this degree program. One response was from College of Micronesia. We think this is very valuable information. Currently, more than 300 students from the Federated States of Micronesia, Palau, and the Commonwealth of Northern Mariana Islands are enrolled in agriculture-related Associate degree programs. Instructors at Community Colleges in FSM, Palau, and CNMI with a Bachelor degree in Agriculture or Nutrition or related subjects will have the opportunity to pursue an MS degree at UOG to advance their career in order to apply for promotion and tenure at their respective institutions. This strongly suggests the graduate program will promote educational collaboration of Land Grant insular institutions in Micronesia. All regional students with a long-term goal of graduate studies will have more choices and more opportunities with the inclusion of SAFNR in UOG's graduate offerings.

Q. Would the Graduate program be a resource in the following areas?

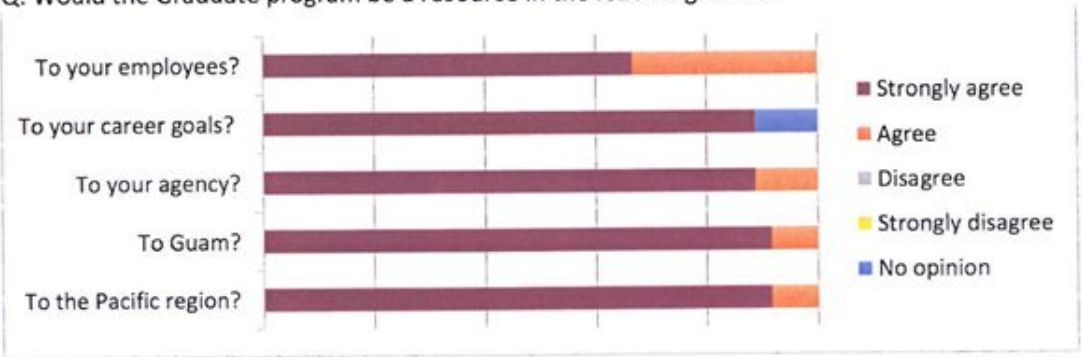


Fig. 1. Response of **stakeholders** from the survey in summer 2016. (n=9)

Similarly, UOG **Alumni** in the survey (**Attachment A-2**) expressed that the graduate program would become a resource for them in their current jobs suggesting they are potential students of the graduate program (Fig. 2). All agreed that the graduate program is a resource to Guam and the Pacific region. Only one respondent, who already has a MS degree, responded that the program would not be a resource for his career goal.

Q. Would the Graduate program be a resource in the following areas?

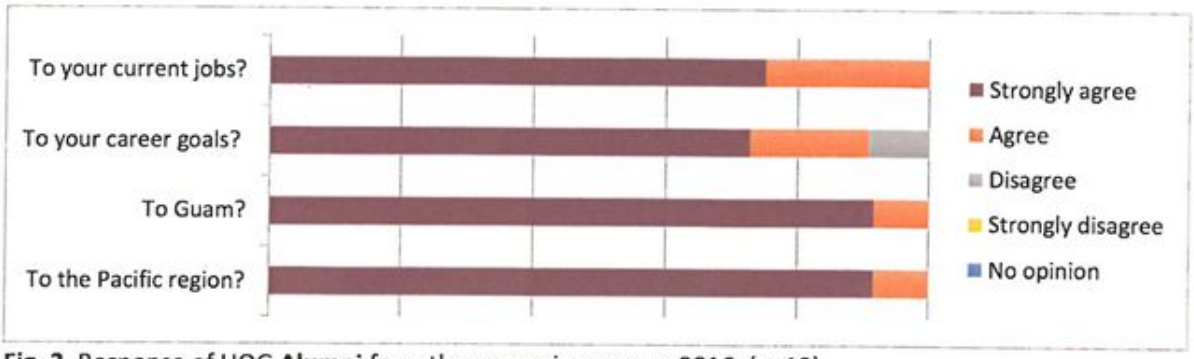


Fig. 2. Response of UOG **Alumni** from the survey in summer 2016. (n=12)

Local and National Needs:

Guam's Northern and Southern Soil Water Conservation Districts (SWCDs):

This summer, we obtained an additional support letter from the Soil Water Conservation Districts (SWCDs) (**Attachment B**). The SWCD is actively engaged with stakeholders of Guam overseeing local and federal programs to promote conservation of natural resources and sustainable agriculture. The SWCD noted that "having a relevant local graduate program encourages local students to advance their professional training while helping to build up capacity and provide a needed resource base of professionals that can make substantive quality contribution in the areas of sustainable agricultural production, healthy living and natural resource management."

US Department of Labor:

Each year, the US Department of Labor publishes the Occupational Outlook Handbook online at: http://bls.gov/ooh/. According to the current report (2014) employment of agricultural and food, scientists positions are projected to grow 5% per year from 2014 to 2024, about as fast as the average for all occupations (**Attachment C**). The report adds that employment of agricultural and food scientists is projected to grow as research into agricultural production methods and techniques continues. "Pressure from population growth, increased demand for water resources, combating pests and pathogens, changes in climate and weather patterns, and additional demand for agriculture products, such as biofuels, will continue to spur improvements in agricultural efficiency and sustainability," according to the report.

The National Association of Colleges and Employers (NACE):

Another document related to job opportunity in the U.S. is an article in "**USA Today**" (2015) stating that "graduates of agriculture and natural resources earn much more than the average graduate, raking in an average starting salary of over $51,000. .... work their way up to management positions generally earn the highest earnings over a lifetime — around $800,000 more than the typical college graduate." (http://www.usatoday.com/story/money/personalfinance/2015/01/31/cheat-sheet-highest-paying-degrees/22478439/). This article was based on **Census data**, coupled with **an employer survey analysis by the National Association of Colleges and Employers** (NACE). This article points out that graduates from agriculture and natural resources have very good job opportunities in the US.

National Needs Fellowship Program (NNF)

If the MS degree in SAFNR were implemented, students and UOG would benefit from new USDA-NIFA funding. USDA-National Institute of Food and Agriculture (NIFA) supports graduate studies through their **National Needs Fellowship Program** (NNF) (https://nifa.usda.gov/funding-opportunity/food-and-agricultural-sciences-national-needs-graduate-and-pos). Request for Application (RFA) states that "NIFA administers this Federal assistance grant program specifically **designated for graduate degree programs** and postgraduate training of the next generation of policy makers, researchers, and educators in the Food and Agricultural Sciences. This program, in collaboration with eligible higher education institutions, is developing intellectual capital to ensure the preeminence of U.S. food and agricultural systems." The purpose of the grant is aligned with USDA's strategic goal to "Ensure the development of human capital, communities, and a diverse workforce through research, education, extension and engagement programs in food and agricultural sciences to support a sustainable agriculture system." The statement continues with "The 2015-2020 Employment Opportunities for College Graduates in Food, Renewable Energy, and the Environment Report indicates **shortages of graduates, specifically in the food, agriculture, natural resources and human sciences** disciplines, to fill the estimated 57,900 annual openings for individuals with baccalaureate or higher degrees in food, renewable energy, and environmental specialties between 2015 and 2020." Applicants of this grant should be institutions that confer a graduate degree in at least one of the Targeted Expertise Shortage Areas of :

(a) Animal Production;
(b) Plant Production;
(c) Forest Resources;
(d) Agricultural Educators and Communicators;
(e) Agricultural Management and Economics;
(f) Food Science, Human Nutrition and Human Sciences;
(g) Sciences for Agricultural Biosecurity; and
(h) Integrative Biosciences for Sustainable Food and Agricultural Systems.

Currently, **UOG is not eligible** because **we do not have a graduate program in any of these specific areas.** Approval of SAFNR would allow UOG to benefit from the National Needs Program.

Institutional Needs:

The University of Guam is leading the Western Pacific region in the area of island sustainability and cancer research by establishing the Center for Island Sustainability and the Cancer Research Institute. Both institutes would benefit from the proposed Master's degree program as they have expressed willingness to allow graduate students to work on topics germane to the program and their institutes. Western SARE Graduate Student Grants in Sustainable Agriculture proposals are for graduate students to address issues in sustainable agriculture of current and potential importance to the western region. Dr. Bob Barber, a member of the proposed MS program, is the WSARE coordinator for Guam. He believes that students within the proposed MS program would be eligible to apply for these competitive grants to secure financial support for their studies. But, he also notes that the annual WSARE State Implementation grant has funds that can be used to support one half time graduate student worker annually. UOG CE&O has received these funds since Dr. Barber first applied in 1995, and there has been a steady increase in these funds over the years.

International Needs:

We cannot ignore the international demand for the new program at the University of Guam. The University of Guam is an attractive place for graduate studies for neighboring Asian universities. We have received inquiries from graduate schools of different universities for collaboration in research work and participation in international graduate programs. For example, the Graduate School of Agriculture at the University of the Ryukyus at Okinawa requested UOG's participation in Educational Collaboration with their "International Agriculture Program." The curricula of UOG's EV and BI graduate programs are not compatible with the University of the Ryukyus' curriculum. We will request UOG participation in this program once the MS in Sustainable Agriculture, Food and Natural Resources is approved.

Q2. Is there clear documentation of an identified student population that has expressed interest or willingness to support the graduate program?

Response 2.

We submit evidence of students' support for the SAFNR program:

- Student surveys (2010, 2013 and 2016)
- Student petitions to support the SAFNR program (2015 and 2016)
- Support letters from students (2016)

We conducted **three** student surveys, two earlier (2010 and 2013) which were included in the submission of the proposed graduate program and the third in summer 2016. In the 2016 survey we obtained responses from 41 current students from fifteen (15) different majors (**Attachment A-3**). The majority of respondents were juniors or seniors who have more than 60 credit hours at UOG, six students were also pursuing Minors. More than 90% of students think this graduate program will be a valuable resource to their career goals, to Guam and to the Pacific region (Fig. 3).

Q1. Would the Graduate program be a resource in the following areas?

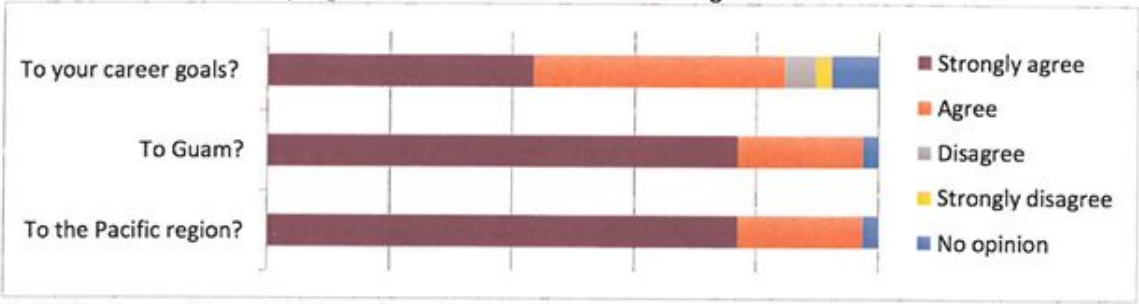


Fig. 3. Response of **Current UOG students** from the survey in summer 2016 (n=39).

Before we started working on the development of the new graduate program, we conducted a student survey in 2009-2010 to see if they were interested in this graduate program as an option at UOG, and to document their intent to enroll in the new graduate program. Table 1 showed the result of the survey. We then created this new graduate program in response to these student voices.

This survey was given to students, while they attended various introductory general education classes. Classes included agriculture, mathematics, Japanese language and consumer family sciences.

Nearly 90% of students either agreed or strongly agreed that the new graduate program should be offered at UOG and about 26% (30 of 114 respondents) indicated interest in enrolling if the program were to be offered.

Table 1. MS in Sustainable Agriculture, Food and Natural Resources opinion survey of undergraduate students enrolled in Introductory Math, Japanese, Agriculture 101,102,136,CF courses during academic year 2009-2010.

Major	No. of Responses to the survey	Q1. Agree to offer the new graduate program at UOG?	Q2. Interested in enrolling in the new grad program?
		No. of Strongly Agree & Agree	Number of "YES"
Agriculture	7	6	6
Biology	12	11	3
Business	9	9	2
Consumer and Family Science	2	2	2
Computer Science	5	4	1
Criminal Justice	9	9	1
Education	21	18	6
Health Science	4	4	0
Nursing	9	8	3
Pre-Engineering	2	2	0
Psychology	6	4	1
Other Majors	9	6	1
Undeclared	19	16	4
Total	114	99	30
		86.8%	26.3%

In 2012-2013 we also conducted a student survey to update the earlier results. Of 204 respondents, nearly 85% did either strongly agree or agree to offer a new MS degree in Agricultural Science (Fig. 4). **(See Attachment D)**

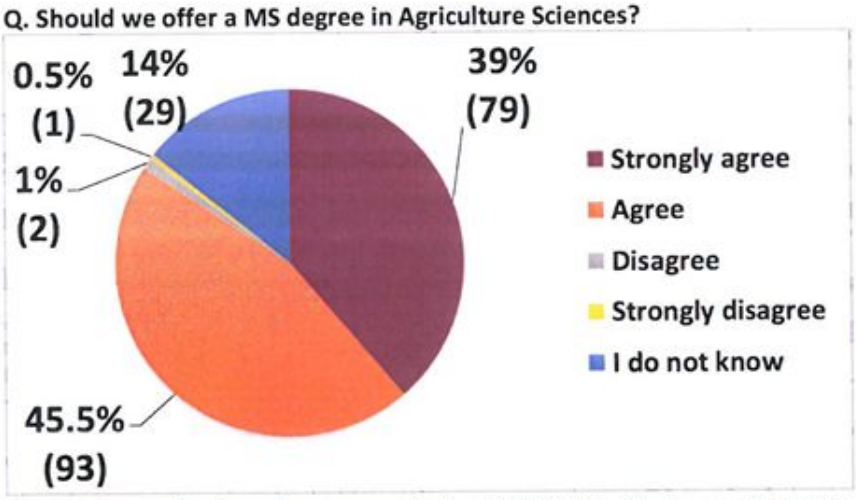


Fig. 4. The result of student survey during 2012-2013 with the number of responses in the parenthesis.

We received student signatures on a petition to support the Graduate program in 2013-2015 and again in summer of 2016 (**Attachment E**), which totals 70 signatures. In addition we obtained six support letters from students and alumni in 2016, and **five** of the six letters (one senior and four alumni) indicated that they would like to enroll in the program (**Attachment F**).

The students highlighted different reasons to enroll ranging from job promotion to cost of education, interest and impact on society: Mark Acosta, an Extension Associate with CNAS indicated that "In order for me to advance both my education and career, I have been searching for MS programs specializing in sustainable agriculture". Jason Andrew, a graduate from Tropical Agriculture at UOG, described his interest in these terms: "As a Palauan native, I am planning to go back and apply sustainable practices in agriculture and food technologies to benefit my island and its people". "I could possibly stay in my current job with GPEPP if there was a graduate option here at UOG", according to Mario Martinez. Chieriel Desamito's reasons for enrolling in this program are "it being offered here on Guam where it is close to home and the feeling of relief of the struggles of working and paying ridiculously high tuition as a non-resident". Gregorio Borja indicated that other graduate programs currently offered at UOG "do not focus on topics in my field of study".

It is also important to note that the Agriculture and Life Sciences has significantly restructured its undergraduate program following the recommendations of the Good to Great process. In this restructuring the rigor of all four tracks was increased and two of the four new tracts will now serve as direct feeder into this new SAFNR program.

Q3. Is the student population one that will be sustained over time based on the needs within the community?

Response 3.

The total enrollment number of students from 2011 to 2015 in the undergraduate programs of Biology, Chemistry, Consumer and Family Sciences, Tropical Agricultural Sciences, and Health Sciences has increased from 200 to 374 (Table 2). They are potential/future graduate students in the proposed program. Many of these graduates will remain on island and may choose one of UOG's MS programs. If even a very modest percentage (5% to 10%) of these biology majors chose to pursue this degree or take advanced courses in this program, this would represent a significant number of students for the program to draw on.

Table 2. The number of students majoring in Biology, Chemistry, Consumer & Family Sciences, Health Science, and Tropical Agricultural Science from 2011 to 2015 and the number of students graduating from UOG in these program during the same years. (All the graduates would have the academic training to purse an MS degree in Sustainable Agriculture, Food and Natural Resources.)

	Number of Students				
Major	**2011**	**2012**	**2013**	**2014**	**2015**
Biology	87	98	128	155	194
Chemistry	9	11	17	20	23
Consumer & Family Science	15	21	24	16	12
Health Sciences	73	89	105	108	126
Tropical Agricultural Science	16	17	21	23	19
Total	**200**	**236**	**295**	**322**	**374**

	Number of Graduates				
Major	**2010-2011**	**2011-2012**	**2012-2013**	**2013-2014**	**2014-2015**
Biology	5	14	9	11	22
Chemistry	0	1	2	2	3
Consumer & Family Science	4	3	5	6	6
Tropical Agricultural Science	2	1	2	5	5
Health Sciences	4	4	16	26	17
Total	**15**	**23**	**34**	**50**	**53**

(Data from University of Guam **Factbook Academic Year 2015-2016**)

The program is designed to serve the Pacific Rim Region and address the unique and changing needs of this region including issues related to our island food systems and surrounding issues. The program is based in the Agriculture and Life Sciences Division, which also is the home of the Cooperative Extension and Outreach Service (CE&O). Faculty within CE&O continuously conduct needs assessments, obtain funds and develop programs that address the needs of island and regional communities. Their professional endeavors are continuously refined and targeted to emerging community needs. This graduate program is in response to the needs they are addressing.

These same needs are being felt by professionals in the food, health and social service agencies and are shaping many of their choices for advanced higher education. For example, a significant problem among our island populations is the growing obesity crisis and the resulting increase in non-communicable diseases. Many professionals are seeing health and public service programs realigning to address these issues. This pushes the need for nutritional training to better mitigate the impacts from this crisis. A second issue of grave concern to federal programs is global food security, both in terms of the actual ability of our island to provide a sustainable independent food supply, as well as the access to balanced nutritional foods by the disadvantaged among our populations. This program will provide research and training opportunities in these and other related food topics for CNMI, FSM, Palau, the Marshall Islands and Guam, making it a natural choice for advanced education for our island professionals. Just like any other program of the University of Guam, our graduates will be able to compete globally.

We believe that student enrollment in the proposed MS program will be sustainable. Through a survey that was conducted during the development of this proposal, we compiled a list of students who expressed high interest in enrolling in the program. We estimate that an average of three students will graduate from the program per year after the second or the third year of the program's approval. This will meet G2G guidelines. Faculty will continuously secure extramural grants to support graduate student research. We are confident that we can support an initial cohort of five students to enroll in the program with USDA-funded education support projects in food and agriculture science programs.

To demonstrate sustainability of demand, we believe that this program will maintain the minimum of five (**5**) graduates per program area each academic year, starting with admission of five cohort students in the first academic year when the program begins (G to G requirement).
We project to have the minimum of three (**3**) graduates annually once this graduate program starts.

Q4. Is there qualified faculty to support the proposed program? In the Good to Great, there should be one dedicated FTE to the graduate program.

Response 4.

We updated membership for this new graduate program by calling a general meeting (Sept. 9, 2016). We requested each faculty who committed to this program to submit a list of extramural grants that could be used to support the graduate students and the program. A total of 16 full-time faculty members have offered their support for this program with 10 full Professors, 2 Associate Professors and 4 Assistant Professors.

The Good to Great Implementation Plan (May 22, 2014) states as an Action item that "there will be a minimum one (**1**) core faculty to sustain a graduate program, " and that "The programs will be augmented by other full-time faculty and/or adjunct faculty necessary to support academic rigor, integrity, and demand for the respective program" (page 14). FTE of our graduate program will follow the current practice at UOG for similar programs, where time allocated in FTE will be compounded (combined) from all participants. The faculty are committed to providing instruction, advisement and support to the program as a service.

Faculty members recognize benefits to their own research and outreach endeavors through engagement with MS students. These faculty members already have funds to easily support 5 or more graduate students on an ongoing basis with half-time jobs under existing grants and programs. The **Chair** (=**Core faculty**) and Vice-Chair of the Graduate program will be elected and will take extra load of program management, like the Division chair of Undergraduate program. We estimate that the Chair's load will be 0.25 FTE/year. We calculated the total FTE of faculty offering courses for two-year plan as shown in **Table 3**.

Table 3. FTE loads of Graduate faculty based on calculation of 3 credit=0.08FTE for 12 month faculty and 0.125FTE for 9 month faculty; 4 credit with lab=0.125 FTE for 12 month faculty and 0.25FTE for 9 month faculty; seminar, thesis, internship course=0.02; and the Program Chair=0.25. For the courses that are not taught by our graduate faculty we consulted with administrators of CNAS for this calculation. Serving Faculty's activities such as serving thesis committee and major advisor roles are not included in this FTE calculation.

Academic Year 1	
Fall Even Year	**FTE**
BI/EV 507 Advanced Statistics (4)	-
EV 513 Environmental Impact Assessment (2)	-
AL 540 (New) Advanced Pest Mgmt. and Biocontrol (3)	0.08
EV 561 Sustainable Landscape Management (3)	0.08
HS 405G Epidemiology (3)	0.08
CF 430G Nutrition Through The Lifespan (3)	0.08
MI 501 Peoples and Cultures of Micronesia (3)	-
HS 491G Current Topics in Health Science (3)	0.08
AL 691 (New) Seminar & Current Topics (1)	0.02
AL 542 (New) Advanced Food Safety (3)	0.08
AL 570 (New) Sustainable Animal Prod. Systems (4)	0.125
AL 695 (New) Thesis (3)	0.02
Subtotal	***0.645***
Spring Odd Year	**FTE**
AG 443G Engineering Tech. Sustainable Trop. Ag. (4)	0.125
BI/CH 419 Biochemistry (4)	0.250
AG 481G Environmental Soil Science (4)	0.125
SW 690 Social Action/Intervention Res. (3)	0.08

Academic Year 2	
Fall Odd Year	**FTE**
AL 536 (New) Advances in Sustainable Aquaculture (3)	0.08
AG 451G Agri. & Natural Resource Management (3)	0.08
MI 501 Peoples & Cultures of Micronesia (3)	-
EV/BI 545 Fisheries Biology (4)	-
HS 405G Epidemiology (3)	0.125
CF 435G Sports Nutrition (3)	0.08
HS/NU 416G Research in Nursing and Health Sci. (3)	0.125
HS 491G Current Topics in Health Science (3)	0.125
AL 539 (New) Public Health Nutrition (3)	0.08
AL 600 (New) Research Methods in Ag. Sc. (3)	0.08
AL 691 (New) Seminar & Current Topics (1)	0.02
AL 695 (New) Thesis (3)	0.02
AL 698 (New) Internship (3)	0.02
Subtotal	***0.835***
Spring Even Year	**FTE**
BI/EV 503 Biological Literature (2)	
CF 455G Food Chemistry (4)	0.125
CF 460G Advanced Human Nutrition(3)	0.08
EV 512 Evn. Sci. Eco./Management/Law (3)	-

HS 491G Current Topics in Health Science (3)	0.125
MI 514 Health & Human Adaptations in Mic. (3)	-
AL 600 (New) Research Methods in Ag. Sc. (3)	0.08
AL 691 (New) Seminar & Current Topics (1)	0.02
AL 581 (New) Principles of Plant Nutrition (3)	0.08
AL 695 (New) Thesis (3)	0.02
AL 698 (New) Internship (3)	0.02
AL 505 (New) Nutritional Epidemiology (3)	0.08
Subtotal	***0.925***
Summer Odd Year	**FTE**
HS 491G Current Topics in Health Science (3)	0.125
AL 695 (New) Thesis (3)	0.02
AL 698 (New) Internship (3)	0.02
Subtotal	***0.165***
Program Chair (Core Faculty of the program)	***0.250***
Total	**1.985**

SW 690 Social Action/ Intervention Res. (3)	0.125
HS 405G Epidemiology (3)	0.125
BI 425G Molecular Biology (5)	0.250
HS 491G Current Topics in Health Science (3)	0.125
AL 566 Agroecology for Island Sustainability (3)	0.08
AL 691 (New) Seminar & Current Topics (1)	0.02
AL 581 (New) Principles of Plant Nutrition (3)	0.08
AL 695 (New) Thesis (3)	0.02
AL 698 (New) Internship (3)	0.08
Subtotal	***0.985***
Summer Even Year	**FTE**
HS 491G Current Topics in Health Science (3)	0.125
AL 695 (New) Thesis (3)	0.02
AL 698 (New) Internship (3)	0.02
Subtotal	***0.165***
Program Chair (Core Faculty of the program)	***0.250***
Total	**2.235**

All members of the graduate program are capable of guiding and teaching graduate students, and providing support for student research projects with extramural grants. However, the lack of graduate students has constrained the implementation and progress of identified research project and, more importantly, a missed opportunity for learning. The involvement of the faculty will ensure the sustainability of the graduate program over time. Examples and current grants obtained by faculty are listed in Table 4.

Table 4. Examples of extramural grants that will support the Graduate Program

Funding Agency	Title of Grant	Year	PI or Investigator	No. of Graduate Students possibly supported
USDA-APHIS	Temperature-stable sample collection and enhanced molecular diagnostic testing of coconut palm viroids	2016-2017	A. Blas	1
US Forest Service	Monitoring Cycad Health	2014-2018	A. Blas	1
UOG-CNAS	Coconut rhino beetle as a transmission vector of Tinangaja disease	2016-2017	A. Blas	1
USDA-APHIS	Palm pests and pathogens: Monitoring Survey in the Pacific Region	Pending	A. Blas	2
NIH NIMHD	A cohort for studying the burden of cardiometabolic diseased in Guam and Pohnpei	2016-2021	Y. Paulino R. Leon Guerrero T. Aflague	1
NIH BUILD	Enhancing cross-disciplinary infrastructure training at Oregon	2014-2019	Y. Paulino	1
NIH/NCI	Betel nut intervention trial	2015-2020	Y. Paulino	1
NIH/NCI	University of Guam/Cancer Research Center of Hawaii Partnership	2015-2020	R. Leon Guerrero	1
USDA/NIFA	Children's Healthy Living Program for remote underserved minority populations in the Pacific region	2011-2017	R. Leon Guerrero B. Barber	1
USDA/NIFA	Evaluating the rate of soil organic carbon (SOC) following the removal of the plant residue from the degraded lands of southern Guam	2015-2019	M. Golabi	1
DOI/TAP	Ecofeed project	2014-2017	M. Golabi M. Marutani H. Diambra-Odi	1
USDA/NIFA	Real-time optimization of irrigation scheduling in the farms in	2016-2019	M. Golabi	2

Funding Agency	Title of Grant	Year	PI or Investigator	No. of Graduate Students possibly supported
	Guam			
USDA/NIFA/McSt	Refinement and mitigation of Casuarina equisetifolia decline components responsible for tree loss in Guam	2015-2019	R. Schlub	1
USDA/NIFA/WARE	Professional producer grant: screening tomato variety for suitability on Guam in response to the arrival of tomato leaf curl Guam virus in the Western Region	2014-2017	R. Schlub	1
USDA/NIFA/WARE	Plant disease diagnostic training for agricultural professionals in Guam and the Northern Mariana Islands	2014-2017	R. Schlub	1
USDA/NIFA/McSt	Propagation and outplanting strategies for Guam's rare and declining forest species	2014-2018	M. Marutani	1
USDA/NIFA	Plant genetic resources conservation and utilization	2013-2018	M. Marutani	
USDA/NIFA/RIGP	Integrated sustainable small farm training in the Pacific Islands	2016-2018	M. Marutani	1
NIH/NCI	Identification of pro-inflammatory molecules in involved in Areca nut carcinogenesis	2015-2018	J. Yang	1
Gov. Guam	Local GADTC Hatchery	2016-2018	H. Jiang	2
USDA/NIFA/WSARE	Western Sustainable Research and Education State Implementation Grant	1995-2018	L.R. Barber	1
US Fish & Wildlife Service	Seed Collection, Seed Storage, Propagation and Outplanting of Serianthes nelsonii and Species Being Considered for Listing Under the Endangered Species	2016-2017	J. McConnell	1
US Forest Service	Guam's Forest Inventory and Analysis (FIA) Program and Micronesia Challenge's Terrestrial Monitoring Program's Forest Inventory	2016-2021	J. McConnell	2
USDA/NIFA/McSt	Genetic make-up of the Serianthes taxa	2014-2018	J. McConnell	1
US Dept. of the Navy	CESU (Cooperative Ecosystem Studies Units)	2016-2018	J. McConnell	2

Q5. The proposed graduate program can also discuss how this will be aligned to the proposed Agriculture and Life Science (undergraduate) degree program.

Response 5.

The new Agriculture and Life Sciences undergraduate program is one of several programs that have the potential to feed into this program. Briefly it is worth mentioning that graduates from several other programs at UOG could potentially benefit in their careers by completing this program. For example, nationally and regionally there is a strong desire to bring gardens into schools and incorporate the science behind these gardening and other life science practices like nutrition into the Department of Education's curricula aligned with the common core. In response to trending education priorities, teachers on Guam are requesting for graduate courses in applied gardening, basic nutrition, and food science. Additionally, there are business program graduate engaged in entrepreneurial enterprises involved in value added processing and other food-related businesses. Lastly, there are potential students from the Biology program and Micronesian Studies who can enhance their respective studies with courses offered in the new graduate program.

In particular, the ALS undergraduate program has two tracks designed to prepare graduates for the new graduate program, as well as, other existing graduate programs locally and abroad. As the result of the G2G activities, we have designed a stronger instructional core in our undergraduate program. This fully complements the proposed program. The ALS research (WPTRC) and extension (CE&O) programs were highly recognized during the G2G program evaluation process and we would like

to integrate our efforts to expand into a relevant graduate program with a focus on research projects. Faculty will also engage and benefit in their research and extension programs by having a graduate program that truly relates to their own research areas. A majority of faculty members in this new graduate program have grants that are capable of supporting graduate research (see table 4 above). The new Agriculture and Life Sciences (ALS) degree program is the result of merging the Tropical Agriculture Science (TASP) and the Consumer and Family Sciences (CFS) programs in accordance with the University's Good to Great recommendations. The new ALS Undergraduate program will offer four tracks:

a. Agriculture and Natural Resource Science (research emphasis)
b. Tropical Agriculture Production,
c. Human Nutrition and Food (research emphasis)
d. Child and Family Life Sciences

Graduates in two of the four tracks (Agriculture and Natural Resource Sciences and Human Nutrition and Food) will be prepared for graduate studies in food and agricultural sciences and related fields with no additional, or limited additional course work. Graduates in the other two tracks will require a few additional courses to be prepared for graduate studies.

The new ALS program:

Implements an ALS Core course set providing foundational knowledge and overarching ALS skills preceding track--specific courses,
Requires more interdisciplinary study across the tracks, and
Intensifies preparation for graduate school through more robust science and math requirements.

The Undergraduate Agriculture and Life Sciences (ALS) program serves both majors and non-major students of UOG and other regional institutions. The program prepares majors to graduate with the knowledge, skills, and values that will enable them to succeed in: jobs (both public and private) in agriculture, nutrition, family and related life sciences; graduate or other professional schools; and contributing to their families and communities. The ALS program curriculum will provide graduates with education, work and training experiences designed to guide them into becoming professionals and leaders in Guam and the Western Pacific.

The Undergraduate ALS Program Learning Objectives (PLO) are:

1. Disciplinary Knowledge and Skills
2. Research Skills
3. Analytical Skills
4. Communication Skills
5. Ethics and Professionalism
6. Multicultural Competence
7. Life-Long Learning and Integration of Knowledge from the Sciences and the Arts

The proposed MS program builds on the undergraduate program in offering opportunities to enhance research and community engagement skills that will address current issues in agriculture and food services for the region and also provide for labor shortages in Agriculture and Nutrition and Food Sciences. There are two tracks with research emphasis: (a) Agriculture and Natural Resources; and (c) Food Sciences and Nutrition. The Graduate PLOs are coherent and consistent with the Undergraduate PLOs. This represents a deliberate and conscious continuity in aligning the program objectives. Also, as

noted above both the undergraduate program and this MS program are driven by identified local needs in agriculture and food sciences/nutrition. Many of the program faculty are working on locally identified needs in their research and extension programs, graduate students in the program will have the opportunity to work on funded projects that address local and regional needs under the two areas of research emphasis.

Q6. Where will graduates serve after degree completion? Is the new program going to train new professional into the field of study or are these people in existing positions in the community who will be in a one time student enrollment for the degree program?

Response 6.

We anticipate that a portion of our early student cohorts in the program will come from recent UOG graduates with degrees in Tropical Agricultural Science, Biology, Chemistry, Health Science, and Consumer and Family Sciences. Students will also come from the ranks of Government of Guam, Federal Agency employees, and instructors of other insular Land-grant institutions like College of Micronesia who have long awaited a degree program aligned with the disciplines they are currently working in. After degree completion, graduates have many opportunities afforded to any other graduate student and specifically to the following:

a. Doctoral candidates at other institutions
b. Program Managers at UOG
c. Faculty at Guam Community College
d. Faculty at College of Micronesia/Palau Community College/College of Northern Mariana Islands
e. Guam Department of Agriculture (GDOA)
f. Guam Department of Public Health and Social Services (DPHSS)
g. US and Guam Environmental Protection Agency (EPA and GEPA)
h. USDA-Natural Resource Conservation Service, Farm Service Agency, and Rural Development
i. USDA-Animal and Plant Health Inspection Service (APHIS)
j. Private sector in Agriculture/ Food technology/ Food retail/ Nutrition and Wellness/ Hospital/ Environmental Chemistry Laboratory
k. Guam Department of Education (GDOE)
l. Department of Defense Education Agency (DoDEA)
m. Research Associates with the Western Pacific Tropical Research Center (Agricultural Experiment Station)
n. Extension Agents with the Cooperative Extension & Outreach Service.
o. Employment world-wide

In reference to training, both new students as well as currently employed agents in the community will benefit from this new degree program by choosing the full degree or opting for certificates.

In conclusion:

This new graduate program is in response to stakeholder's demands and the desire of students to pursue graduate education in sustainable agriculture, food, nutrition and natural resources. Our proposed program also brings together graduate faculty with specialties in Human Nutrition, Food Chemistry, Microbiology, Biotechnology, Health Science, Horticulture, Plant Pathology, Aquaculture, Forestry, Animal Sciences, Agricultural Economics, Soil Science, Plant Nutrition and other Food and Agriculture Science related subjects. The G2G review indicates that Faculty in CNAS, in particular Agriculture and Life Science Division, have successfully secured research and extension grants. The faculty of this graduate program have a track record of securing extramural grant. However, we feel

currently there is a shortage of graduate students with the specialized training who can engage in research activities with faculty. Having graduate students in these specialized areas means that faculty will be able to progress in both their research and education activities. It is especially true for junior faculty who need to present their accomplishments in research endeavors as a requirement of UOG faculty in their earlier years of employment. This proposed graduate program enables faculty to accomplish research and instruction missions based on their own expertise while supporting graduate studies of a new group of UOG students.

We request for the Committee's further support of the proposed program. Should you have any further questions, please contact us.

Thank you very much.

Program Representative: Dr. Mari Marutani

ALS Division Chair: Dr. Bob Barber

Members:

Dr. Tanisha Aflague

Dr. Andrea Blas

Dr. Hauhouot Diambra Odi

Dr. Shubir Ghosh

Dr. Hui G. Jiang

Dr. Rachael Leon Guerrero

Dr. Romina King

Dr. James McConnell

Dr. Yvette Paulino

Dr. Robert Schlub

Dr. Maika Vuki

Dr. Jian Yang

Dr. Mohammad Golabi

UOG Station, Mangilao, Guam 96923
Telephone: (671) 735-2100/01 Fax: (671) 734-4600
A Land Grant Institution Accredited by the Western Association of Schools and Colleges

Appendix 1: Letters of Support and Petitions

a. Letters of Support
b. Newspaper Article in Support of Program
c. Student Petition in Support of Program

COLLEGE OF MICRONESIA – FSM

P.O. Box 159, Kolonia, Pohnpei
Federated States of Micronesia 96941

Tel: (691)320-2480/2481/2482 (Ext. 138)
320-8181 (Direct Line)

Fax: (691)320-2479)
Direct Fax: 320-2972

Office of Vice President for Cooperative Research and Extension

Date: 03.18.2013

Dr. Helen Wippy, Ph.D.
Senior Vice President for Academic Affairs

From: W. James Currie
Vice President for Cooperative Research and Extension
College of Micronesia-FSM

SUBJECT: **Masters of Science in Sustainable Agriculture: letter of support**

Greetings Dr. Wippy,

I am writing to you in support of the application of the Agriculture and Life Sciences Division, College of Natural and Applied Sciences of the University of Guam for the Master of Science in Sustainable Agriculture, Food and Natural Resources Program.

Such a Masters level program will be very useful to our Micronesian students. Due to the special USDA funding for Insular Areas, we have inc. ased our enrollment in agriculture programs here at COM-FSM many fold over the past 7 years. The number of graduates planning to advance to university level is similarly increasing and two are presently at UoG in agriculture studies. Each year we send students on experiential learning visits to University of Guam to improve this link. A Master's program can only increase this interest since the University of Guam is their natural choice for higher education.

At this time, we are also facing a severe shortage of personnel throughout many of our departments due to the imminent retirement of a high percentage of qualified and experienced staff. Many of those positions require a BSc. Level degree or in many cases, a Masters is preferred. To have the opportunity to complete both of these degrees at our local university would certainly encourage our students.

I fully support the application for this program and if I might make two suggestions to potentially improve this offering they would be:

- I would actually change the name to **Master of Science in Island Sustainability, Agriculture and Food**
- Provide as much of the program as possible on-line through some form of Distance Education.

Sincerely,

W. James Currie

GOVERNMENT OF GUAM
DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES
DIPATTAMENTON SALUT PUPBLEKO YAN SETBISION SUSIAT

EDDIE BAZA CALVO
GOVERNOR

RAY TENORIO
LIEUTENANT GOVERNOR

JAMES W. GILLAN
DIRECTOR

LEO G. CASIL
DEPUTY DIRECTOR

NOV 07 2012

Helen Whippy, PH.D.
Senior Vice President for Academic Affairs
University of Guam, UOD Station
Mangilao, GU 96923

Dear Dr. Whippy

I am writing in support of the application of the Agriculture and Life Sciences Division, College of Natural and Applied Sciences of the University of Guam for the Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management Program.

This graduate program would fill a need for improved nutrition and health of our island communities, and also add new graduate courses to enlighten our staff in search for continuing education in public health.

In my opinion, a Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management is long overdue. Sustainability involves a dynamic interaction of the social, economical and environmental challenges of the twenty first century and it is a great satisfaction to learn that the University community is engaging its resources to address critical issues of food biosecurity.

I fully support the application of this prestigious program to enhance the quality of life of our communities.

Sincerely,

James W. Gillan

11.8.12

123 CHALAN KARETA, MANGILAO, GUAM 96913-6304
www.dphss.guam.gov • Ph.: 1.671.735.7102 • Fax: 1.671.734.5910

Department of Agriculture
Dipåttamenton Agrikottura

163 Dairy Road, Mangilao, Guam 96913

Director's Office	734-3942/43; Fax 734-6569
Agricultural Dev. Services	734-3946/47; Fax 734-8096
Animal Health	734-3943
Aquatic & Wildlife Resources	735-3955/56; Fax 734-6570
Forestry & Soil Resources	735-3949/50; Fax 734-0111
Plant Nursery	734-3949
Plant Protection & Quarantine	472-1651; 475-1426 Fax 477-9487

Edward B. Calvo
Governor

Ray S. Tenorio
Lt Governor

Mariquita F. Taitague
Director

Manuel Q. Cruz
Deputy Director

December 26, 2012

Memorandum

To: Mrs. Helen Whippy, Ph.D.
Senior Vice President for Academic Affairs

From: Director of Agriculture

Subject: **Masters of Science in Sustainable Agriculture**
Re: Letter of Support

Buenas yan Hafa Adai!

I am writing in support of the application of the Agriculture and Life Sciences Division, College of Natural and Applied Sciences of the University of Guam for the Master of Science in Sustainable Agriculture, Food and Natural Resources Program.

This graduate program would be extremely beneficial for agriculture activities and increase productivity on Guam and Micronesia, and most of all, provide human resources badly needed for island agricultural sustainability. The program will also provide for further educational and career development of existing Bachelor of Science Agricultural Majors currently employed by Agriculture as well as an opportunity for others in related science field to expand their potential.

Our department relies on well-trained individuals who understand the need and aspiration of people from Guam and Micronesia, to lead our communities to fulfill a basic need: food self-sufficiency for better health. We believe that the University of Guam has an obligation to be proactive and to be the institution that shows the way in this region, for a more sustainable lifestyle.

I fully support the application of this vital program to provide continued education to our staff and train new leaders for agriculture of the twenty first century.

Sincerely,

MARIQUITA F. TAITAGUE

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November 12, 2012

Agricultural graduate degree program needed

By Dr. Mohammad H. Golabi

"Thousands of years ago, humans around the world survived by hunting, fishing and gathering edible plants. Over time, they learned how to grow plants from seeds and to domesticate animals. The rise of agriculture made it possible for groups of humans to stay in the same area for their entire lives and eventually led up to the development of civilization," Jeff Harris wrote in the Oct. 28 Pacific Sunday News.

With the same token, prominent soil scientists, ecologists and numerous historians and archeologists have reported that once flourishing agricultural regions of the world are reduced to barren wastelands caused by man-generated soil degradation.

In this regard, during the recent annual conferences of the Soil Science Society of America in Cincinnati, Ohio, which I attended, the keynote speaker also pointed out that malnutrition among the children and high rate of poverty among the nations, including America, is due to insufficient agricultural productivity because of failing to invest in agricultural research and innovation.

As stated by the keynote speaker, agricultural productivity and improved food quality is the driver to the new economical growth and prosperity among the nations of the world. Decline in agricultural investment increases a nation's poverty level more than any other sectors of economies of the developed and developing countries, said the speaker.

The speaker went on to say that agricultural development is more important than the industrial development in lifting the poverty of the world. In order to remove people from the chronic poverty and prevent social crisis and mitigate malnutrition among the children, improved and sustainable agricultural practices were believed to be a way out of poverty and economical problems of today's world, said the keynote speaker.

She further stated that we cannot have a healthy and safer world without a sustainable agriculture.

Funding for agricultural research and innovation is versioned to be the most important parameter for the well-being of the globe, she mentioned. In this perspective, a graduate degree program in agricultural sciences here at the University of Guam could be a positive change in the island's higher educational system, influencing the island prosperity and wealth.

In addition to our undergraduate program in the College of Natural and Applied Sciences, a graduate degree program in agricultural sciences is expected to improve the economic and social well-being of this and other neighboring islands of Micronesia. A sound graduate program in agricultural sciences would provide training and opportunities for graduate students who would be equipped with education and

knowledge necessary to support a productive and sustainable agriculture, hence healthy economy and prosper island communities.

Dr. Golabi is an associate professor of soil and environmental sciences at the University of Guam.

College of Natural and Applied Sciences

Division of Agriculture and Life Sciences

Master of Science in Sustainable Agriculture, Food and Natural Resources

Updated Signature Sheet (October 2014)

For students interested in a Master of Science in "Sustainable Agriculture, Food and Natural Resources" among our current student body. If you are interested in this degree program should it become available in about one year, please sign your name below and provide the information requested.

Name	Signature	Year	Major
Julius Rodriguez		Junior	BS. & Entrepreneur.
Jennifer Kennedy		Freshman	Tropical Ag.
James Reina		Sophomore	Undeclared
Fred [illegible]	[illegible]	Sophomore	undeclared
Fernando Scott Pereda		Junior	Psychology
Ifani P. Zuniga		Sophomore	undeclared
Joseph Sadun		sophomore	undecided
Bonn Delos Trinos		Junior	Math
DJ Hallons Kephas		dunior	Pre-Engineering
Kephas JR		sophomore	Criminal justice

College of Natural and Applied sciences

Division of Agriculture and Life Sciences

Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management

Signature Sheet

For Students Interested in a Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management

We are surveying what the interest is in a Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management among our current student body. If you are interested in this degree program should it become available in about 2 years, please sign below and provide the information requested. Thank you.

Name	Signature	Year	Major
Charity Catynao		Junior	Education
CAROL PRESA		Jr.	COFS
Jessilyn Santos		Junior	Education
Arisha Nishimura		Junior	CTFS
Christopher Dela Cruz		Junior	PE/Health
Kenda Ignacio		Freshman	PE/Health
Sophia Lugan		Sophomore	Education
Johannah Naputi		Sophomore	english
Michael Arteio		Sophomore	Criminal Justice
Mistee SanNicolas		Senior	Education
Jonathan Igros		Sophmore	Business

Robbie G. SanNicolas		Sophomore	CFS
JAELYSE LIZAMA		SOPHOMORE	Business
Regine Joy Acabado		Senior	Education
Maelene Nangauta		junior	ECE (education)
Johanna Palencia		Sophomore	CFS
Lovelynn Trinidad		junior	Undeclared
jan Cris Nacioncero		Freshman	Undeclared
benaventeRita		Junior	Education
Yuing Chan		Sophomore	Business Accounting

College of Natural and Applied sciences

Division of Agriculture and Life Sciences

Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management

Signature Sheet

For Students Interested in a Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management

We are surveying what the interest is in a Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management among our current student body. If you are interested in this degree program should it become available in about 2 years, please sign below and provide the information requested. Thank you.

Name	Signature	Year	Major
Gregorio C. Borja III		Junior	Trop. Ag (Preserves
Johnedel Dawsin		Jr.	Trop. Ag.
Cinnis Colitoy		Senior	Biology
Davia Calvo		Junior	Trop. Ag.
Paulina Fojtíková		Junior	AG
Patrick Mendi		Junior	AG
Jonathan K. Davis		Senior	Tropical AG
myg cordero		Senior	Health Saence
Phillip John R. Cruz		Graduate	BA: Marketing
Justine Crisostomo		Junior	Computer Scien
Keith A. Aguero		Senior	Criminal Justice
Stephanie Hanna		Junior	Trop. Agric
Kateri R. Cruz		Freshman	Tropical Agriculture

Tracy Gogne Sophr. Junior Nursing Public Admin.

College of Natural and Applied Sciences

Proposal of Master in Sustainable Agriculture, Food and Natural Resources

The University of Guam, Mangilao, Guam 96923

Petition in support of Proposal of Master of Science in Sustainable Agriculture, Food and Natural Resources

Name	Occupation	Village	Signature
Nadeleine Doone	Americorps Tutor	Mangilao	Doone
Edward James Barlongo	Americorps Tutor	Dededo	
Ryan Saliva	Americorps Tutor	Yona	
MAILE DOLORES	Student	Toto	
SARA EVANGELISTA	student	Yigo	
ARVENE SAPANTA	STUDENT	BARRIGADA	
John Mariano	Student	Mangilao	
Thealanie Montoya	STUDENT	MANGILAO	
Claret Aguon	STUDENT	Mangilao	
Eric Delfin	STUDENT	SINAJANA	
Kristina Wheeler	Student	Toto	
Melanie Blas	Teacher	Dededo	
PEGGY DENNEY	Recycle Admin	Yona	Peggy Denney
Jane Dia	Resource Info. ED Officer	Barrigada	Jane Dia

College of Natural and Applied Sciences

Proposal of Master in Sustainable Agriculture, Food and Natural Resources

The University of Guam, Mangilao, Guam 96923

Petition in support of Proposal of Master of Science in Sustainable Agriculture, Food and Natural Resources

Name	Occupation	Village	Signature
Terence A. Lapitan	Student	Yigo	
FJ Yatilman	Student	Agat	
Caitlin Manibusan	Student	Dededo	
Cassandra Dimla	student	Dededo	
Jovana Meno	Student	Sinajaña	
Diana Carlos	student	Yigo	
Christine I. Camacho		Mangilao	
Roxanna Miller		Mangmong	
Ray Shalin		agat	
Tarryn Chan	"	Mangilao	
Victor Torres	GIS Manager	Yigo	
Cheena Ann Jose	teaching assistant	Dededo	

College of Natural and Applied Sciences

Proposal of Master in Sustainable Agriculture, Food and Natural Resources

The University of Guam, Mangilao, Guam 96923

Petition in support of Proposal of Master of Science in Sustainable Agriculture, Food and Natural Resources

Name	Occupation	Village	Signature
Jaquay Soriano	Environmental Scientist	Chalan Pago	
Myg cordero	teaching assistant	Tamuning	
[illegible]	Engineer		
Jimmy Camacho	Government	Yigo	
[illegible]	Energy and Construction	Santa Rita	
LINDA TATREAU	TEACHER	MERIZO	
Terry M. Perez	Planner	Sinajana	
ESTHER TAITAGUE	Env Planner	Yona	
Kyle Blas	Research Asst	Yona	
Michael Camer	Accountant	Yigo	
Bryan BLAS	TECHNICIAN	YIGO	
Jed Helson	TECH	X140	
Emmanuel John Agnon	Math Instructor	Mangilao	
Alison Hadley	Extension Associate	Mangilao	
Brittany Agnon	Extension Assistant	Yona	

College of Natural and Applied Sciences

Proposal of Master in Sustainable Agriculture, Food and Natural Resources

The University of Guam, Mangilao, Guam 96923

Petition in support of Proposal of Master of Science in Sustainable Agriculture, Food and Natural Resources

Name	Occupation	Village	Signature
Tom Reyes	Teacher	Dededo	
Dorothy Shultice	Ast. Mgr.	Agana Hghts.	
R. Calvo	UOG	Mangilao	
Francisco E. Palacios	Energy Tech.	Mangilao	
ELVIE Tyler	Sustainability Coordinator	Santa Rita	
Julius Naranjo	Professional Photographer	IPAN	

College of Natural and Applied Sciences

Proposal of Master in Sustainable Agriculture, Food and Natural Resources

The University of Guam, Mangilao, Guam 96923

Petition in support of Proposal of Master of Science in Sustainable Agriculture, Food and Natural Resources

Name	Occupation	Village	Signature
McEllen A. Alfred	student	Ded.	
Deanna Komiyama	student	Malojloj	
Between Alokoa	Progra Mang	Yona	
Hyde A. Quintanilla		Yoming	
Ursula Herrera	Herbalist	Tumon	
Jessica Nangauta	Research Assis	Malesso	
Eva A Cruz	Extension Associate	Mangilao	
Maybelle Quinata	Program Coordinator	Santa Rita	
Bonita Blas	student	Dededo	
Tasi Faith Taitano	student	Mangilao	
Sarah Taitano	UOG student	Maite	
Roque Rosario II	eco warrior	Mangilao	
TINA ERICKSON	MCM & ecoWARRIOR	YIGO	
Paula Fagata	student	Dededo	
Dayrit, Jessika G.	Student	Dededo	

College of Natural and Applied Sciences

Proposal of Master in Sustainable Agriculture, Food and Natural Resources

The University of Guam, Mangilao, Guam 96923

Petition in support of Proposal of Master of Science in Sustainable Agriculture, Food and Natural Resources

Name	Occupation	Village	Signature
Gregorio Borja	STUDENT	Sinajana	
Shiella Jose	student	Dededo	
Arlene Castro	teacher	Dededo	
Sunny Lee	Director/AmeriCorps	Asan	
Leilani Giltinag	Student	Mangilao	
Jamesina Lanalisei	student	Mangilao	
Amanda Santos	Student	Ragman.	
Roger PARUNAU	Engineer	Dededo	
Noel Cruz	Engineer	Mangilao	
NORBERT MAFNAZO	ENGR	DEDEDO	
Lorie Sabangan	Engineer	Yigo	
MARVIN POLIARCO	Engr	Yigo	
SYLVIA IPANAG	Engr	Yigo	
Glenn Loon Guerrero	Program Mgr Engineer	Agana Heights	

Appendix 2: Course Schedule

Master of Science in Sustainable Agriculture, Food and Natural Resources

Two-Year Schedule

Target Date: Fall 2014

Fall Year 1 (Even Year) 2016	Spring Year 1 (Odd Year) 2017
BI/EV 507 Advanced Statistics (4)	AG 443G Engineering Tech. Sust. Trop. Ag. (4)
EV 513 Environmental Impact Assessment (2)	BI/CH 419 Biochemistry (4)
AL 540 (New) Advanced Pest Mgmt. and Biocontrol (3)	AG 481G Environmental Soil Science (4)
EV 561 Sustainable Landscape Management (3)	SW 690 Social Action/Intervention Res. (3)
HS 405G Epidemiology (3)	HS 405G Epidemiology (3)
CF 430G Nutrition Thr. The Lifespan (3)	BI 425G Molecular Biology (5)
MI 501 Peoples and Cultures of Micronesia (3)	HS 491G Current Topics in Health Science (3)
HS 491G Current Topics in Health Science (3)	MI 514 Health & Human Adaptations in Mic. (3)
AL 691 (New) Seminar & Current Topics (1)	AL 600 (New) Research Methods in Ag. Sc. (3)
AL 542 (New) Advanced Food Safety (3)	AL 691 (New) Seminar & Current Topics (1)
AL 570 (New) Sustainable Animal Prod. Systems (4)	AL 581 (New) Principles of Plant Nutrition (3)
	AL 695 (New) Thesis (3)
	AL 698 (New) Internship (3)
	AL 505 (New) Nutritional Epidemiology

Summer Year 1 (Odd Year) 2017
HS 491G Current Topics in Heath Science (3)
AL 695 (New) Thesis (3)
AL 698 (New) Internship (3)

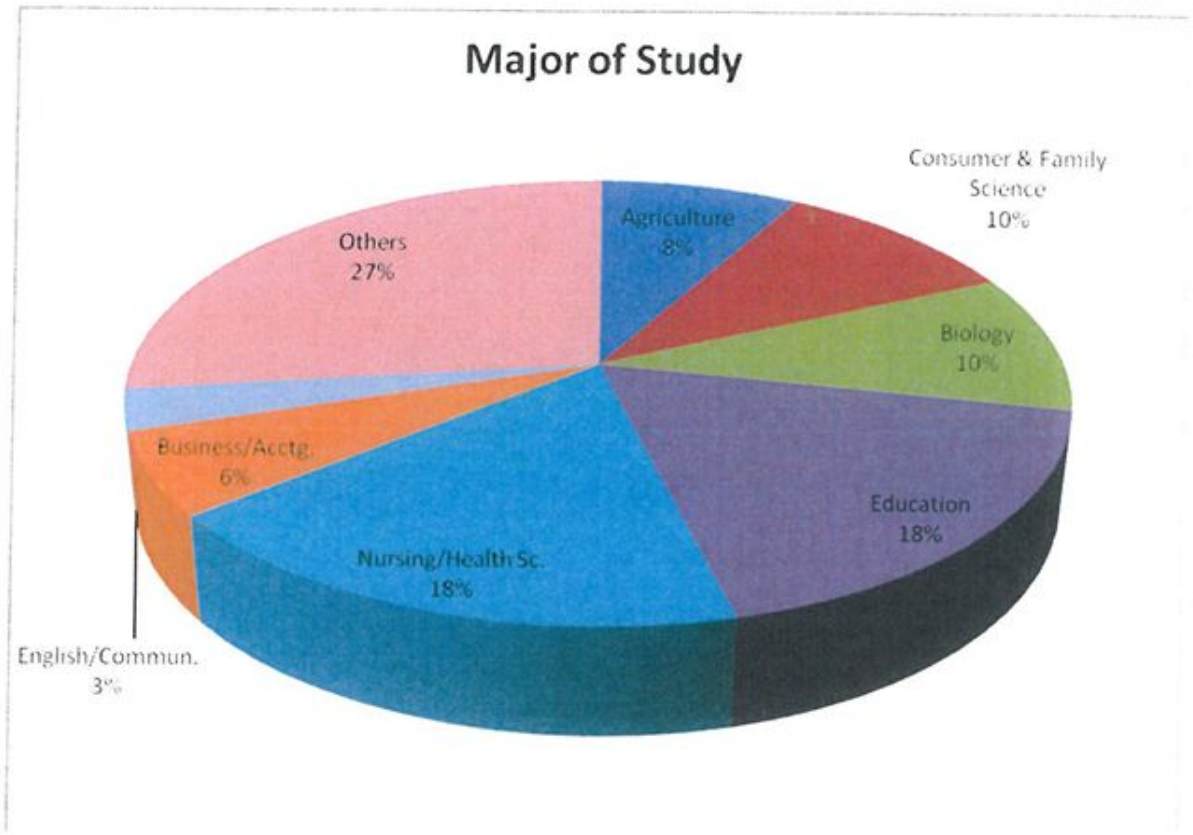
Fall Year 2 (Odd Year) 2017	Spring Year 2 (Even Year) 2018
BI 594 (New) Advances in Sustainable Aquaculture (3)	BI/EV 503 Biological Literature (2)
AG 451G Agri. & Natural Resource Management	CF 445G Food Chemistry (4)
MI 501 Peoples & Cultures of Micronesia (3)	CF 460G Advanced Human Nutrition
EV/BI 545 Fisheries Biology (4)	EV 512 Env. Sci. Eco./Management/Law (3)
HS 405G Epidemiology (3)	SW 690 Social Action/Intervention Res. (3)
CF 435G Sports Nutrition (3)	HS 405G Epidemiology (3)
HS/NU 416G Research in Nursing and Health Sci. (3)	BI 425G Molecular Biology (5)
HS 491G Current Topics in Health Science (3)	HS 491G Current Topics in Health Science (3)
AL 539 (New) Public Health Nutrition (3)	AL 566 Agroecology for Island Sustainability (3)
AL 600 (New) Research Methods in Ag. Sc. (3)	AL 691 (New) Seminar & Current Topics (1)
AL 691 (New) Seminar & Current Topics (1)	AL 581 (New) Principles of Plant Nutrition (3)
AL 695 (New) Thesis (3)	AL 695 (New) Thesis (3)
AL 698 (New) Internship (3)	AL 698 (New) Internship (3)

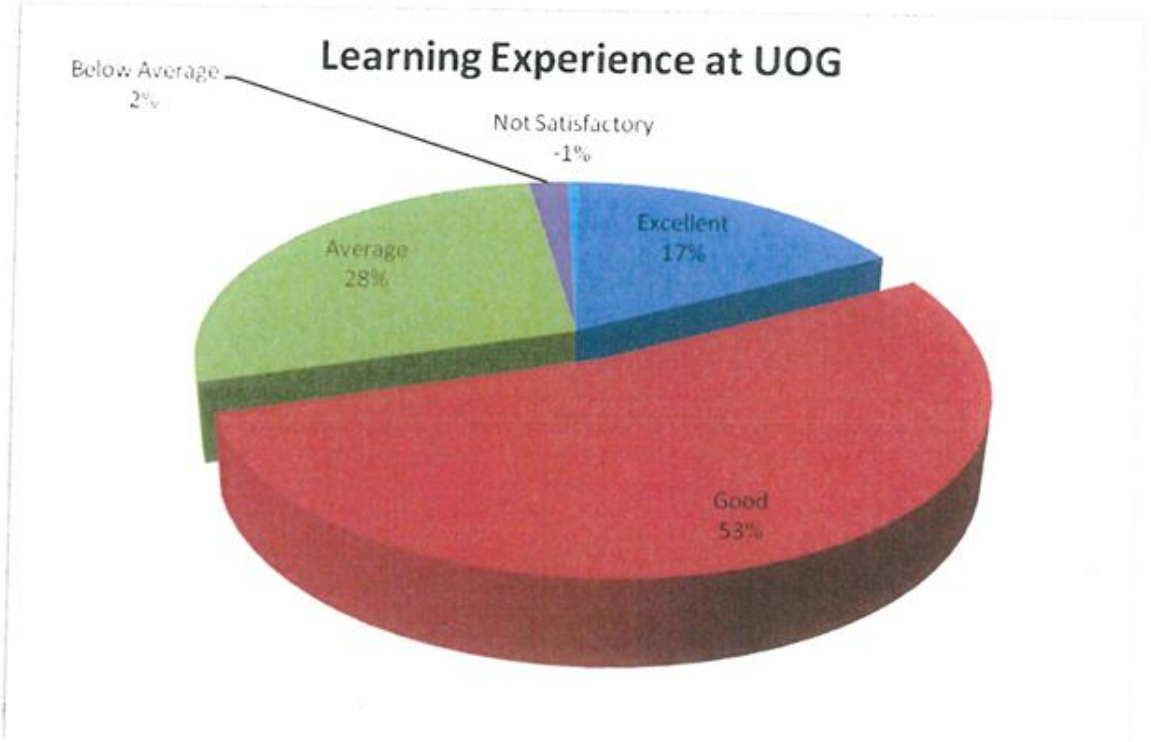
Summer Year 2 (Even Year) 2018
HS 491G Current Topics in Health Science (3)
AL 695 (New) Thesis (3)
AL 698 (New) Internship (3)

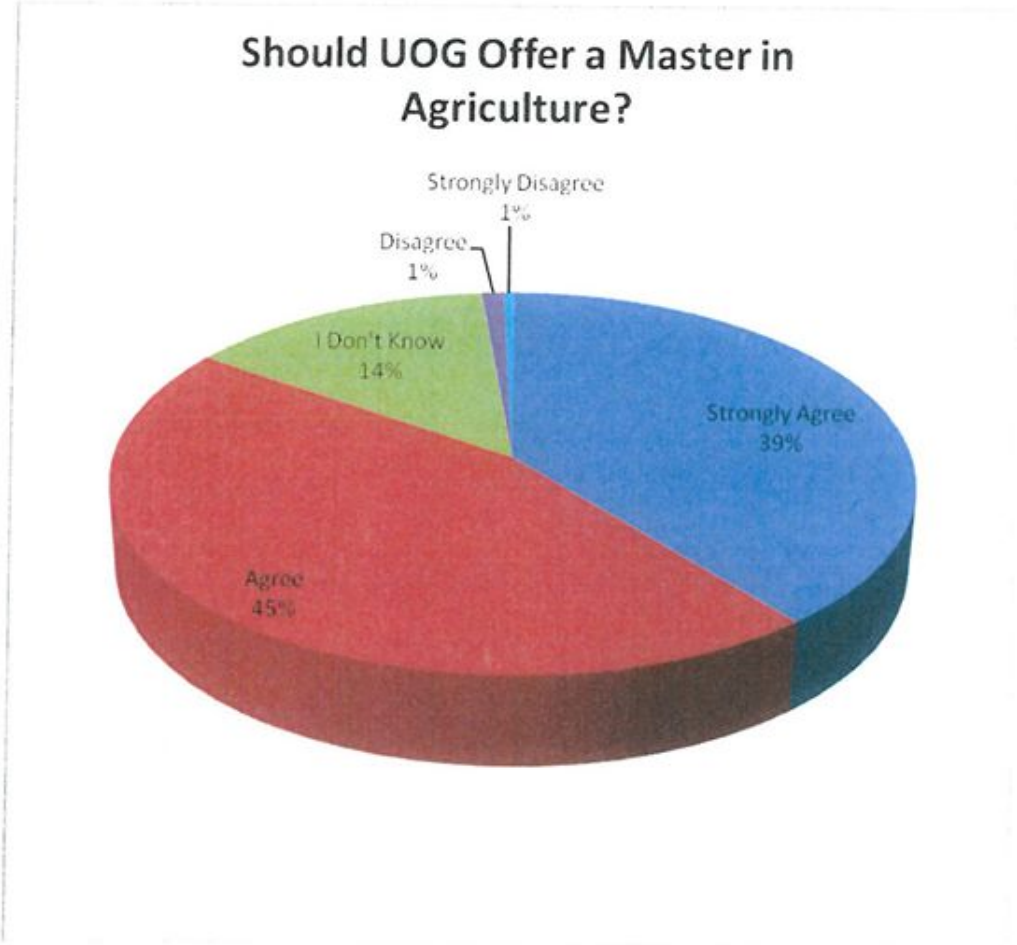
Appendix 3: Student Survey Results

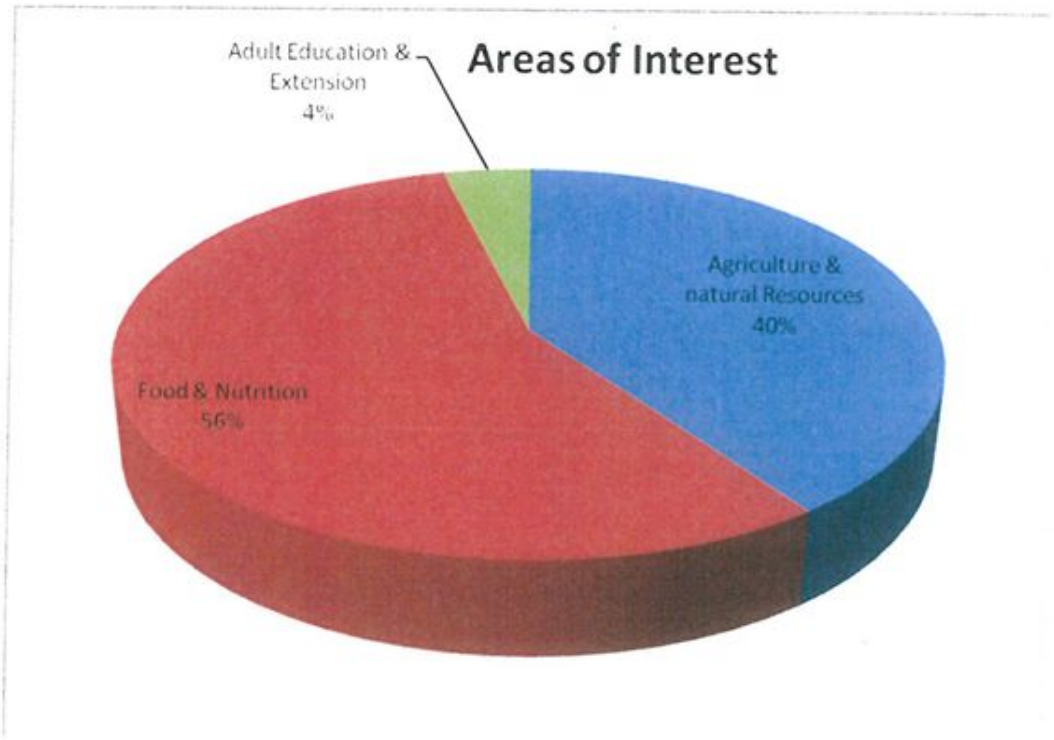
Comments and Analysis of UOG Student Survey Results:

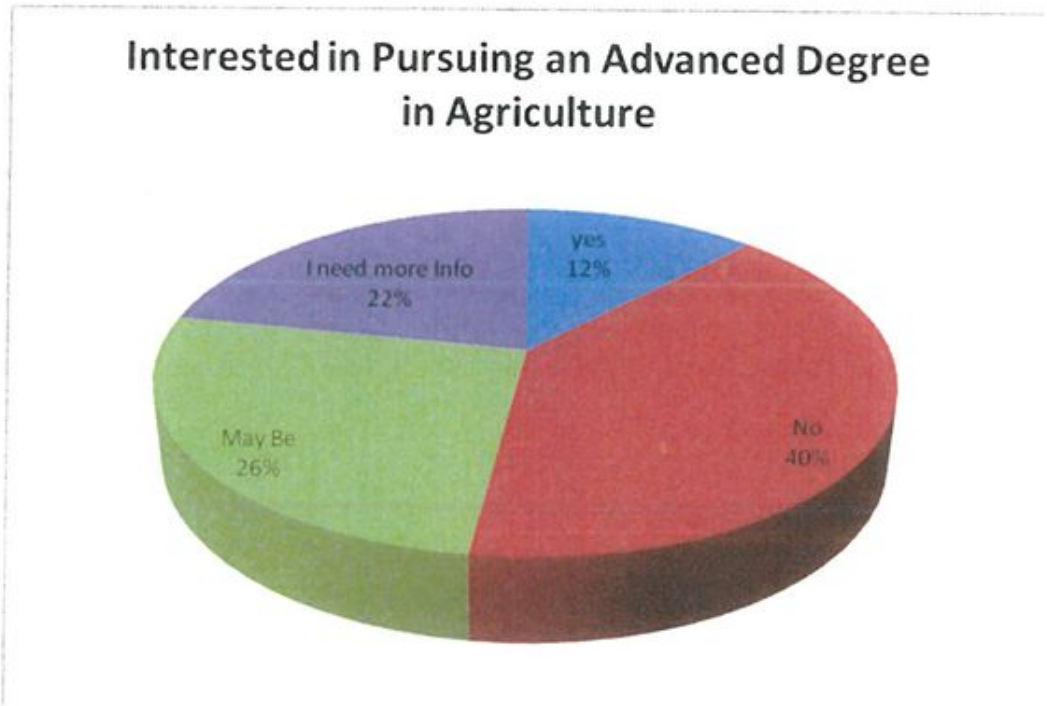
1. On the support of the program, an overwhelming support (84%) was generated by the survey.
2. Interest in pursuing an advanced degree in Agriculture: 12% are interested compared to 8% currently enrolled, which suggest an increase in interest that could be improved with more information on the program and job outlook (48% are not sure or need more information).
3. Most limiting factor to join the program: Job outlook (39%) constitutes the highest limiting factor which can be resolved by more information, followed by tuition (28%) and time (9%). This suggests the importance of funding for financial aid and scholarship (teaching, research and lab assistantship).
4. Availability of financial aid in the form of graduate assistantship (teaching, research or lab) increases the interest for the program from 12% to 63%. The availability of financial aid alone changes drastically the negative perception for the program as the percentage of students who were not interested (40%) dropped to 8%.
5. On the delivery of the program, the majority (47%) does not want this program entirely online and nearly half of the respondents (40%) prefer a hybrid program, which will include some online courses.
6. On the overall learning experience at UOG, the results show a strong evidence of student satisfaction (70%) compared to less than 3% not satisfied.

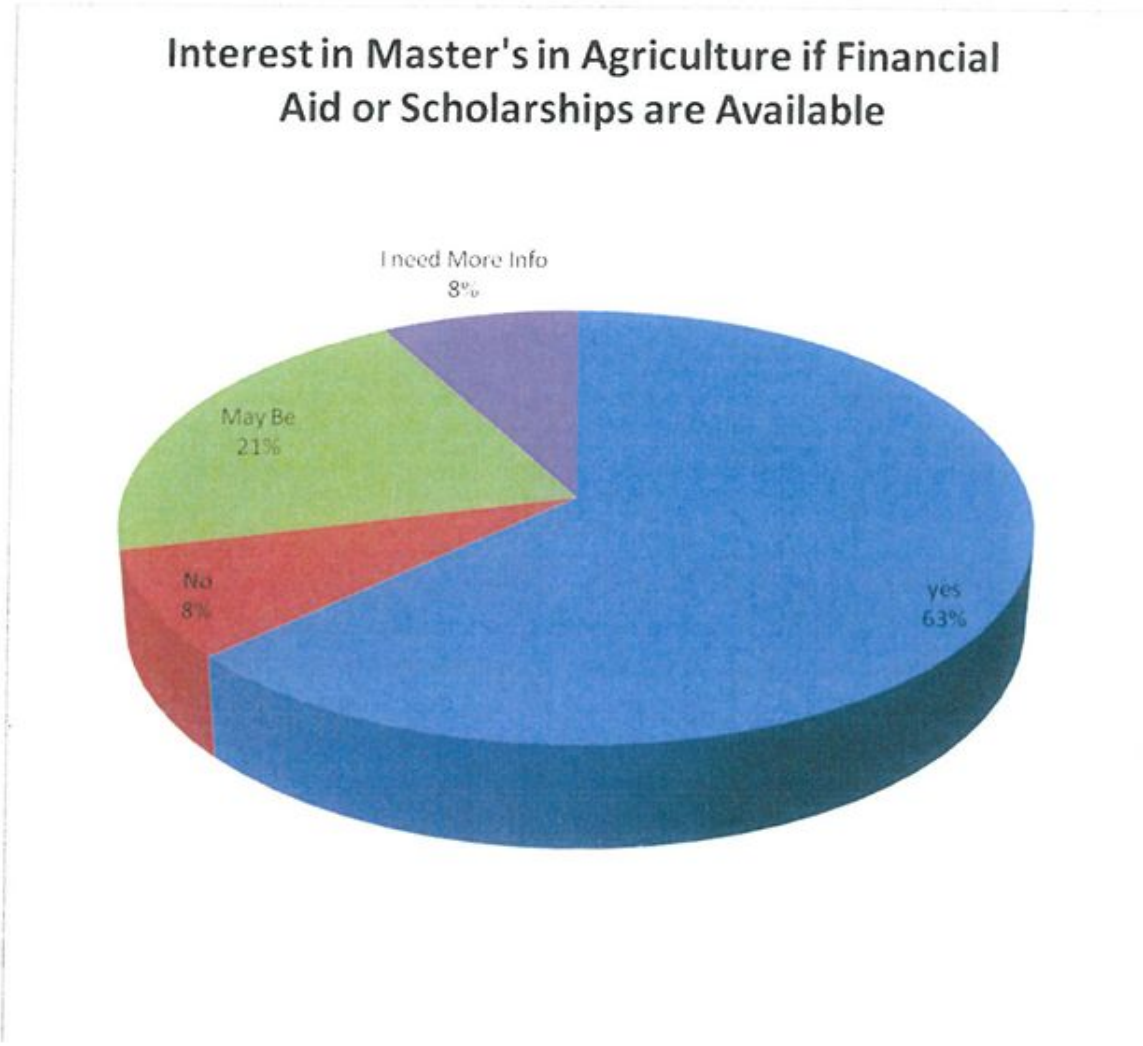

Major of Study
Consumer & Family Science 10%
Agriculture 8%
Others 27%
Biology 10%
Business/Acctg. 6%
Education 18%
Nursing/Health Sc. 18%
English/Commun. 3%

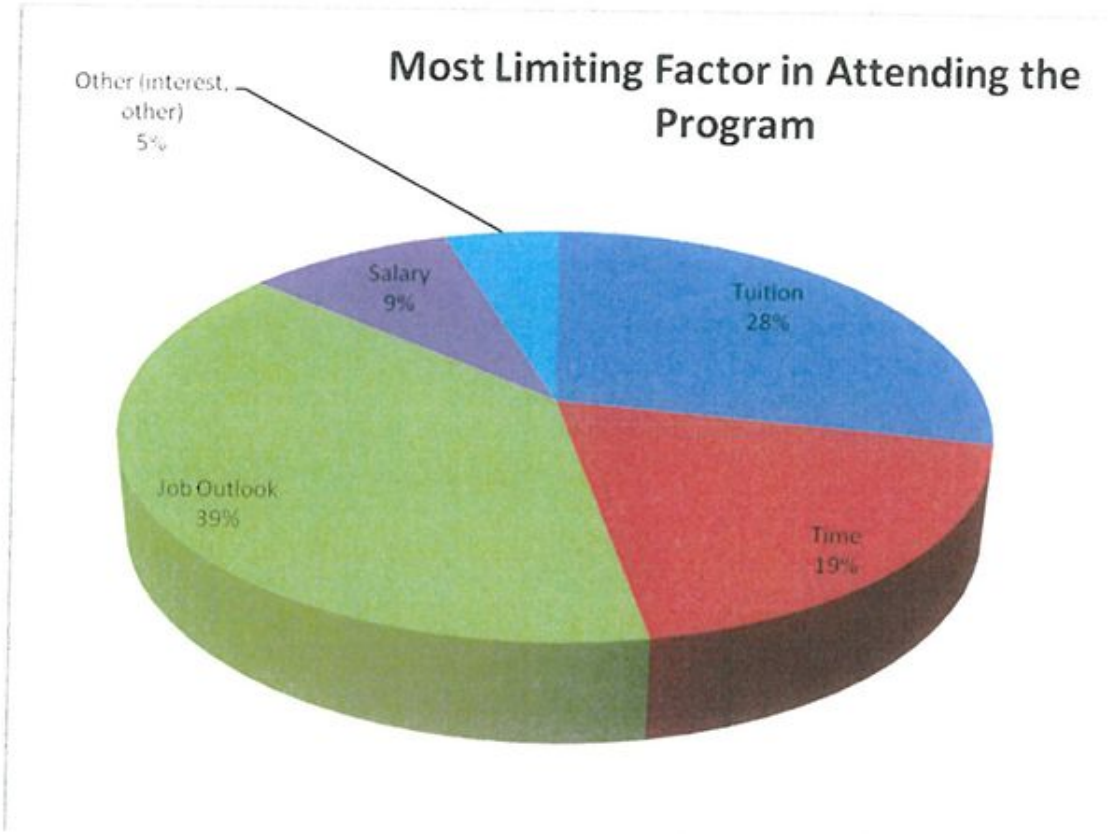

Learning Experience at UOG
Below Average
2%
Not Satisfactory
-1%
Excellent
17%
Average
28%
Good
53%

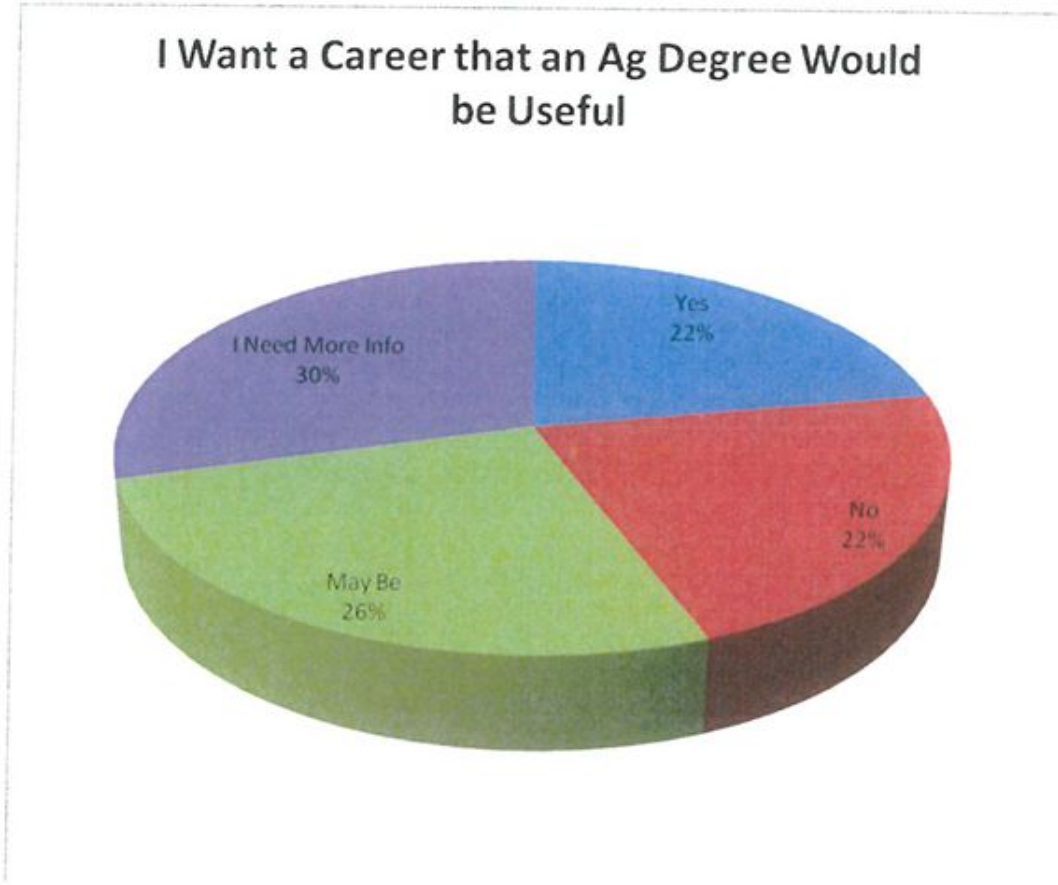

Should UOG Offer a Master in Agriculture?
Strongly Disagree 1%
Disagree 1%
I Don't Know 14%
Strongly Agree 39%
Agree 45%

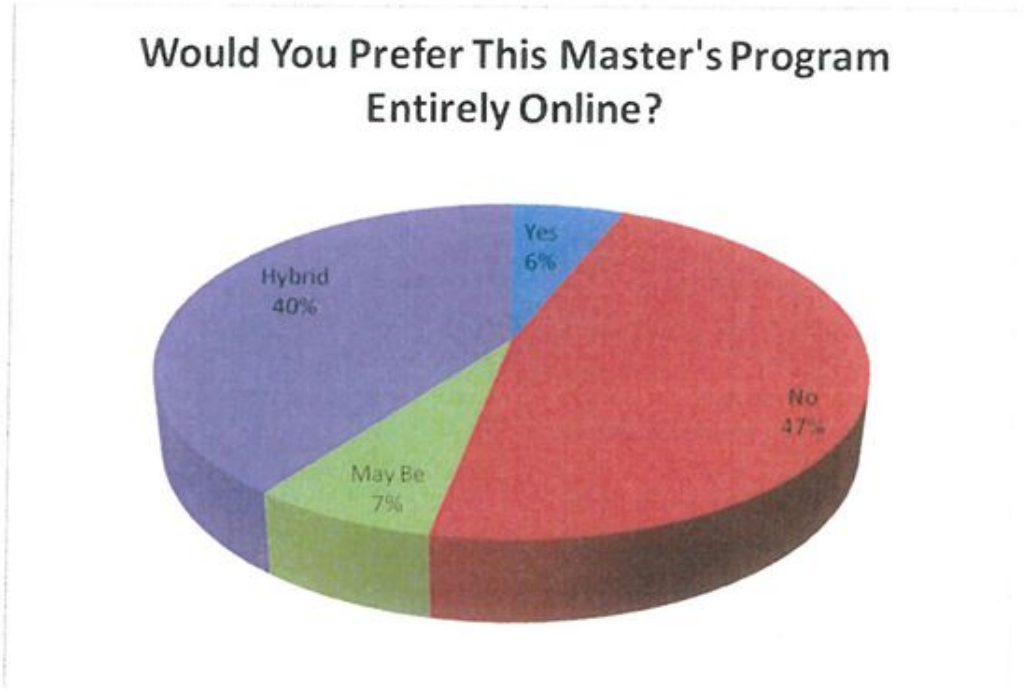

Areas of Interest
Adult Education & Extension 4%
Agriculture & natural Resources 40%
Food & Nutrition 56%

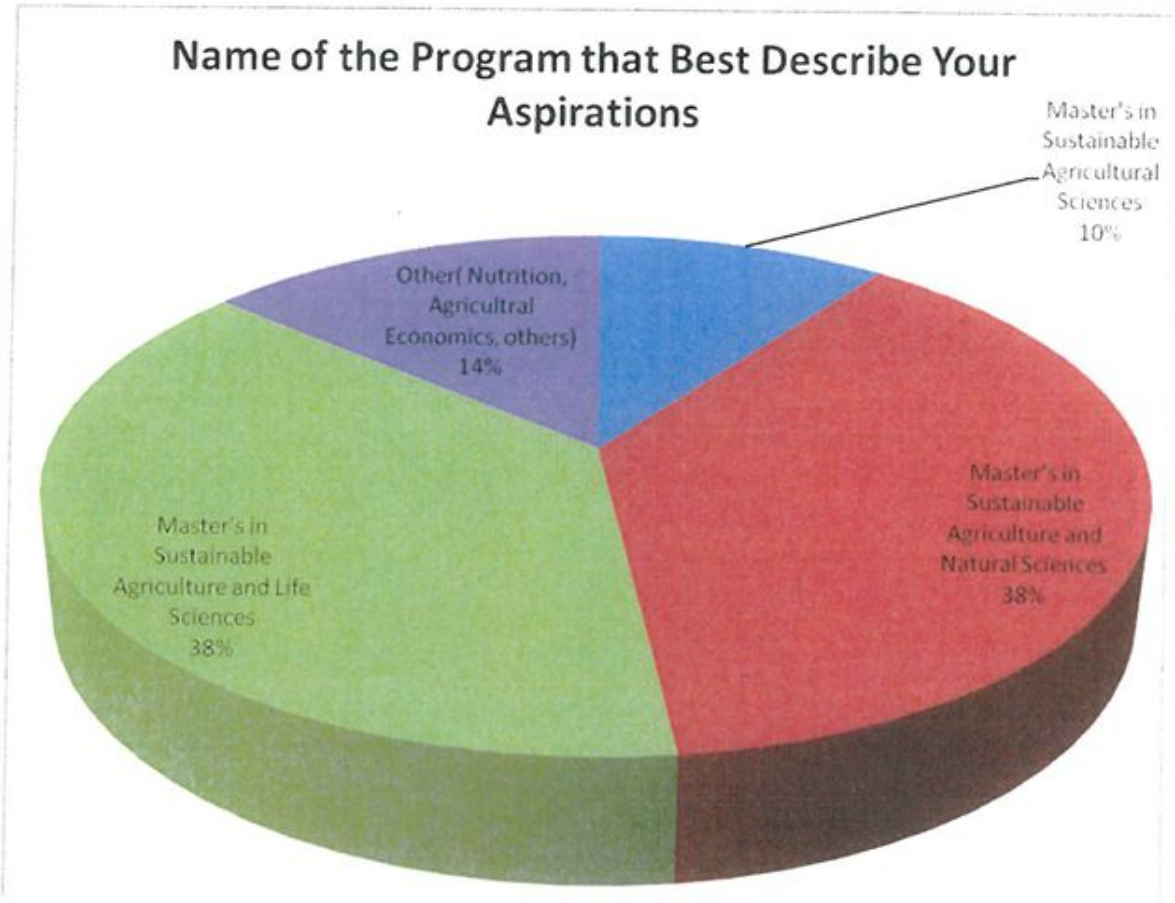

Interested in Pursuing an Advanced Degree in Agriculture
yes 12%
I need more Info 22%
May Be 26%
No 40%

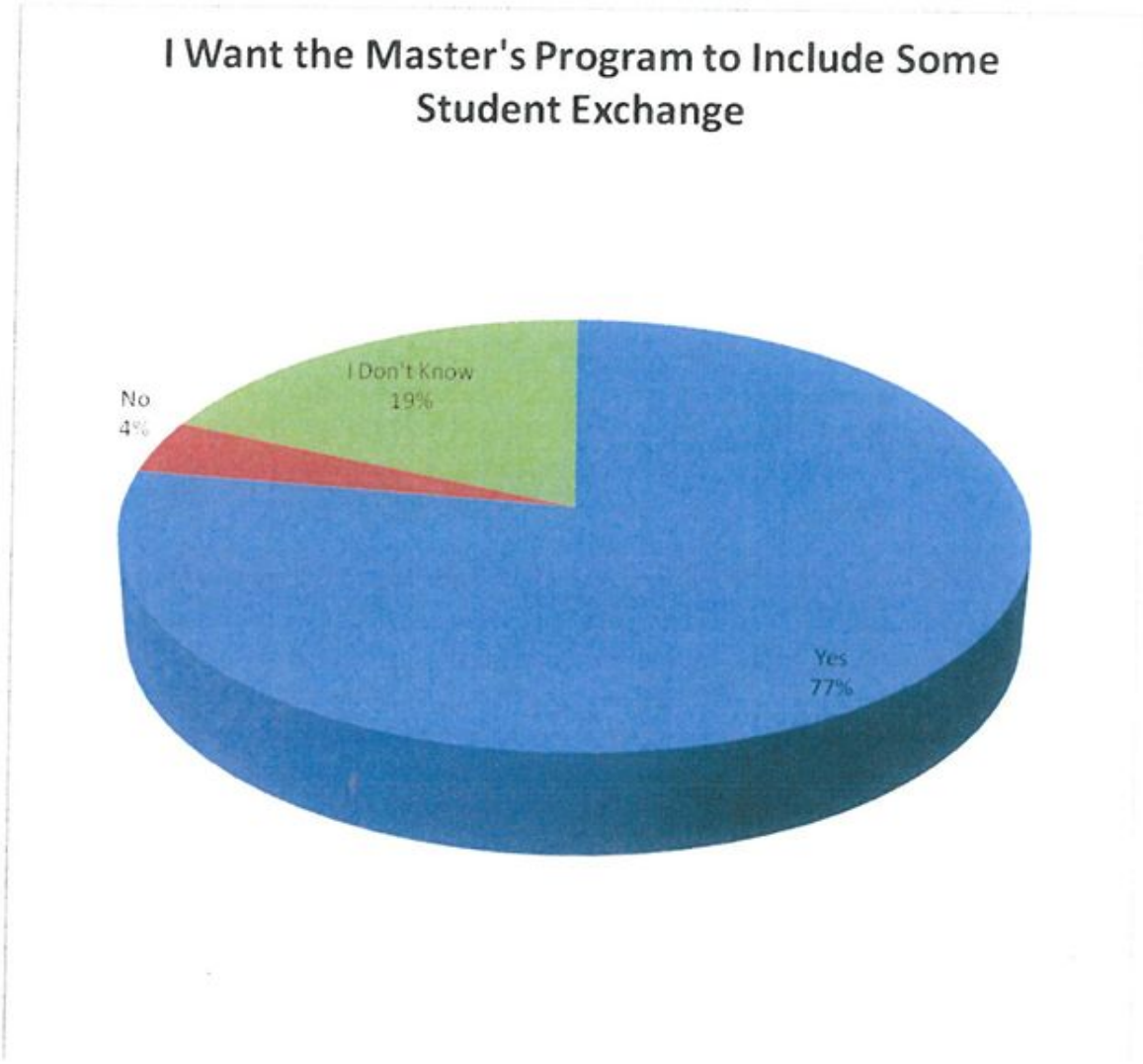

Interest in Master's in Agriculture if Financial Aid or Scholarships are Available
I need More Info 8%
May Be 21%
No 8%
yes 63%

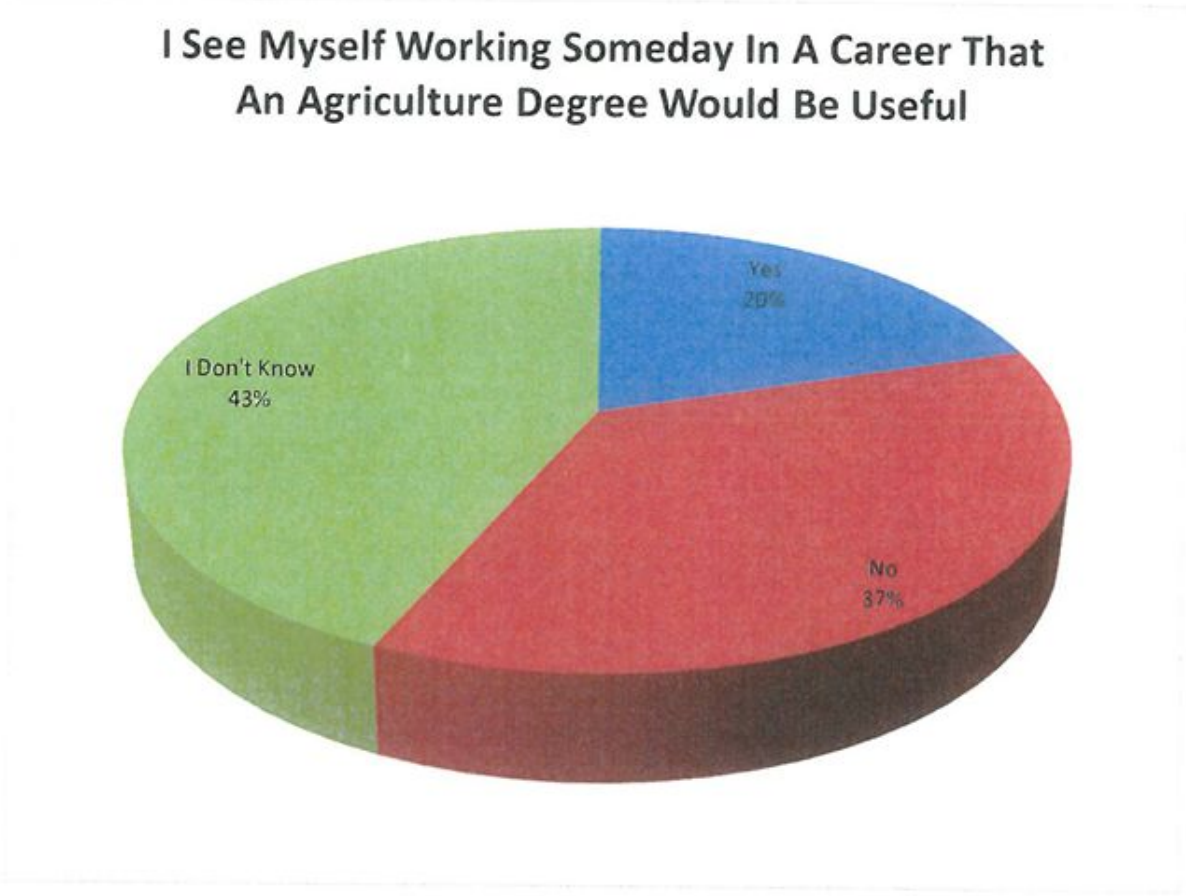

Most Limiting Factor in Attending the Program
Other (interest, other) 5%
Salary 9%
Tuition 28%
Job Outlook 39%
Time 19%

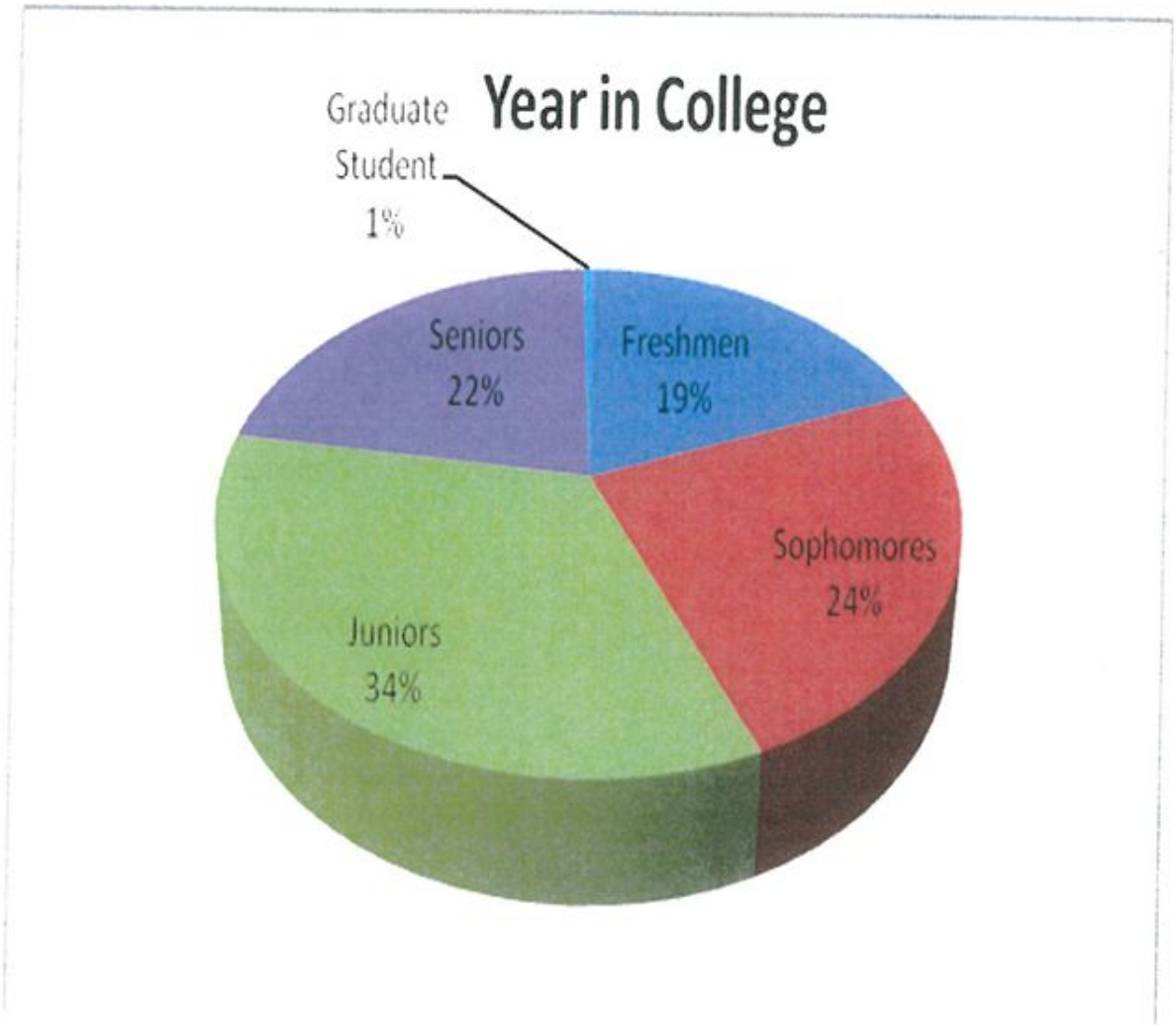

I Want a Career that an Ag Degree Would be Useful
Yes 22%
No 22%
May Be 26%
I Need More Info 30%

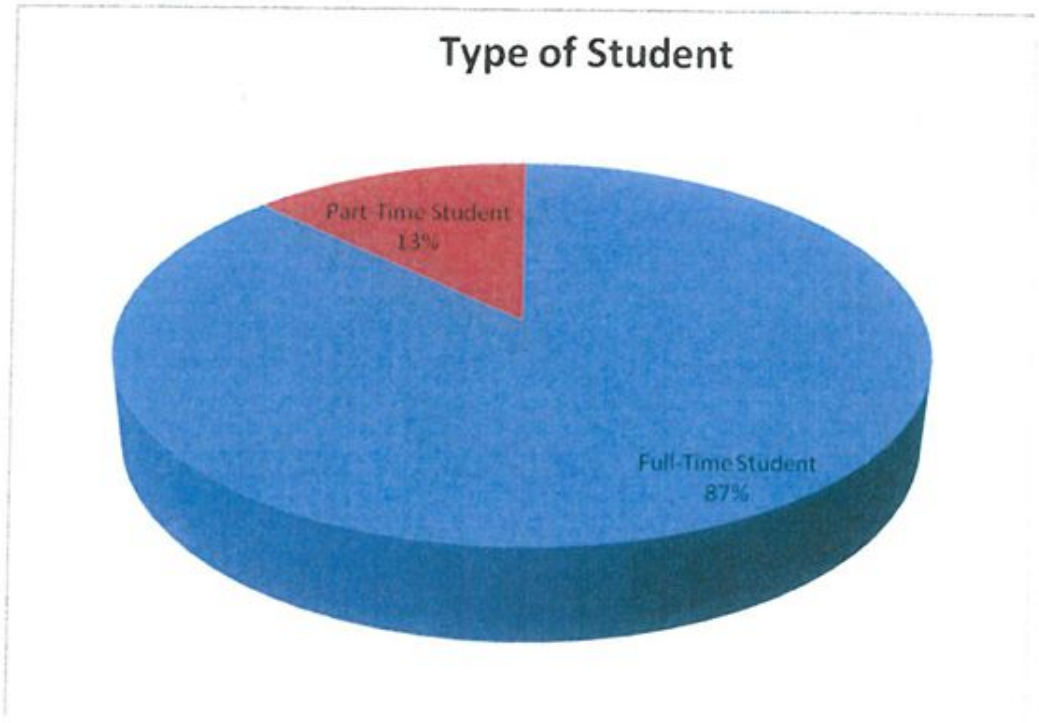

Would You Prefer This Master's Program Entirely Online?
Yes 6%
No 47%
May Be 7%
Hybrid 40%


Name of the Program that Best Describe Your Aspirations
Master's in Sustainable Agricultural Sciences 10%
Other(Nutrition, Agricultral Economics, others) 14%
Master's in Sustainable Agriculture and Natural Sciences 38%
Master's in Sustainable Agriculture and Life Sciences 38%


I Want the Master's Program to Include Some Student Exchange
I Don't Know 19%
No 4%
Yes 77%


I See Myself Working Someday In A Career That An Agriculture Degree Would Be Useful
Yes 20%
No 37%
I Don't Know 43%


Year in College
Graduate Student 1%
Seniors 22%
Freshmen 19%
Sophomores 24%
Juniors 34%


Type of Student
Part-Time Student
13%
Full-Time Student
87%

Appendix 4: Faculty *Curriculum Vitae*

Tanisha Ann F. Aflague
P.O. Box 326757 Hagåtna, GU 96932
Work Phone: (671) 735-2026 Cell Phone: (671) 686-0696
Email: tanisha.aflague@gmail.com

EDUCATION

Doctor of Philosophy	Nutrition, University of Hawai'i at Mānoa, Honolulu, Hawai'i	2012-2015
Master of Science	Nutrition and Coordinated Program in Dietetics, Eastern Michigan University, Ypsilanti, Michigan	2006-2008
Bachelor of Science	Human Nutrition, Food, and Animal Science, University of Hawai'i at Mānoa, Honolulu, Hawai'i	2000-2004

PROFESSIONAL CERTIFICATIONS / MEMBERSHIPS

Licensed Clinical Dietitian	Guam Board of Allied Health Examiners	2008-Present
Registered Dietitian	Commission on Dietetic Registration	2008-Present
Member	American Society for Nutrition	2013-Present
Member	Academy of Nutrition and Dietetics (formerly the American Dietetic Association)	2004-Present
Certified Dietary Manager; Certified Food Protection Professional	The Certifying Board for Dietary Managers	2007-2010
Member	Dietary Manager's Association, Guam Chapter	2007-2008

PROFESSIONAL EXPERIENCE

2015-Present	**Assistant Professor in Nutrition**, College of Natural and Applied Sciences, University of Guam; Mangilao, Guam
2015-Present	**Nutrition Coordinator**, Cooperative Extension Services, University of Guam; Mangilao, Guam
2014-2015	**Extension Associate III**, Cooperative Extension Services, University of Guam; Mangilao, Guam
2012-2015	**Graduate Research Assistant**, University of Hawai'i at Mānoa; Honolulu, Hawai'i "Children's Health Living Program for Remote Underserved Minority Populations in the Pacific Region"
2011-2012	**Consultant for Betel Nut Study**, NIH NCI-U54CA143728-01, University of Guam Cancer Research Center; Mangilao, Guam
2009-2012	**Clinical Dietitian**, Guam Dialysis Center, Innovative Dialysis Systems; Tamuning, Guam
2008	**Health Consultant**, Cooperative Extension Services, University of Guam; Mangilao, Guam, "Guam Pilot Project for Healthy Aging (GPPHA)"
2007-2008	**Program Coordinator & Student Summer Intern**, Micronesian Institute for Disease Prevention and Research; Barrigada, Guam, "NIH Familial Investigation of Nephropathy and Diabetes Mellitus (FIND) Study"
2005-2007	**Programs Coordinator**, Health Services of the Pacific – Diabetes Center; Tamuning, Guam, "Diabetes Self-Management Education (DSME) Program"
2004-2007	**Dietitian Assistant**, Health Services of the Pacific – Home Care; Tamuning, Guam
2004-2005	**Special Diet Assistant**, Guam Memorial Hospital Authority; Tamuning, Guam
2004	**Research Assistant II**, College of Agriculture and Life Sciences, University of Guam; Mangilao, Guam, "Research in Phytochemicals and Antioxidant Activity of Noni (Lada) Fruit"
2003-2004	**Student Assistant,** University of Hawai'i Cancer Research Center; Honolulu, Hawai'i, "Smokers Feed Study"

TEACHING EXPERIENCE

Fall 2015 (present)	College of Natural and Applied Sciences, University of Guam; Mangilao, Guam CF435 Sports Nutrition, Primary Instructor
Spring 2013	Office of Public Health Studies, University of Hawai'i at Mānoa; Honolulu, Hawai'i PH702 Health Promotion Research, Guest Lecturer
Spring 2009 - 2012; Fall 2009	College of Natural and Applied Sciences, University of Guam; Mangilao, Guam CF231 Human Nutrition for Health Professionals, Primary Instructor
Jan. – Sep. 2008	Nutrition Educator, Bureau of Program Administration and Development Contracted Programs, Division of Senior Citizens, Guam Department of Public Health and Social Services; Mangiloa, Guam
Jan. – Sep. 2008	Health Educator, Wellness Program, TakeCare Asia Insurance, Inc.; Tamuning, Guam

PRESENTATIONS AT LOCAL, NATIONAL, OR INTERNATIONAL CONFERENCES

Sept. 3, 2015	"Children 3-10 years old can capture eating occasions using the mobile food record" oral presentation at the 9th International Conference on Diet and Activity Methods; Brisbane, Australia
Mar. 30, 2015	"Examining the influence of cultural immersion on willingness to try fruits and vegetables among children in Guam: The Traditions Study" oral presentation at the 79th ASN Scientific Sessions & Annual Meeting at Experimental Biology; Boston, Massachusetts
Dec. 5, 2014	"Willingness to try fruits and vegetables among children 3-12 years attending summer camp in Guam during 2014" oral presentation at the 1st Behavioral Health in Micronesia Conference; Tumon, Guam
Sept. 20, 2014	"Adaptation and evaluation of the WillTry tool for use among children 3-11 years in Guam" poster presentation at the He Huliau Health Disparities Conference – A Turning Point Community-Academic Partnerships for Pacific Health Equity; Ko Olina, Hawai'i
Apr. 29, 2014	"Adaptation and evaluation of the WillTry tool for use among children 3-11 years in Guam" oral presentation at the 78th ASN Scientific Sessions & Annual Meeting at Experimental Biology; San Diego, California
Apr. 12, 2014	"Evaluating the usability of the mobile telephone food record for capturing eating occasions among children 3-11 years in Guam" oral presentation at the 26th Annual CTAHR and COE Student Research Symposium; Honolulu, Hawai'i
Feb. 14, 2014	"Adaptation and evaluation of the WillTry tool for use among children 3-11 years in Guam" oral presentation at the 13th Annual East-West Center International Graduate Student Conference on the Asia Pacific Region; Honolulu, Hawai'i

PUBLICATIONS

Aflague TF, Boushey CJ, Leon Guerrero RT, Ahmad Z, Kerr DA, Delp EJ. Feasibility and Use of the Mobile Food Record for Capturing Eating Occasions among Children Ages 3–10 Years in Guam. *Nutritents* 2015; 7:4403-4415. doi:10.3390/nu7064403

Boushey CJ, Hanbury AJ, Kerr DA, Schapp TE, Paterson S, Aflague TF, Bosch M, Ahmad Z, Delp EJ. The mobile food record: how willing are adolescents to record? *JMIR mHealth uHealth* 2015; 3(2):e47. doi:10.2196/mhealth.4087

Aflague TF, Leon Guerrero RT, Boushey CJ. Adaptation and evaluation of the *WillTry* tool among children in Guam. *Prev Chronic Dis* 2014; 11:140032. doi: http://dx.doi.org/10.5888/PCD11.140032.

COMMUNITY SERVICE AND UNIVERSITY/OUTREACH ACTIVITIES

Jul. 2014 to Present	Guam Non-communicable Disease (NCD) Consortium Member serving the Data and Surveillance Action and the Nutrition and Obesity Teams; Tamuning, Guam
Nov. and Dec. 2014	Nutrition Seminars for the Village Healthy Weight Initiative, Children's Healthy Living Program; Mangilao, Guam

COMMUNITY SERVICE AND UNIVERSITY/OUTREACH ACTIVITIES

Aug. 2013 to Apr. 2014	Kokua Hawai'i Foundation 'AINA In Schools Nutrition Education Program Docent; Kahala, Hawai'i
Jun. 9-10, 2013	Nutrition Seminars for the Hurao Academy Teachers and Directors as part of their initiative to start a Worksite Wellness Program; Hagåtna, Guam
Sep. 2012 to May 2013	Lunalilo Community School Association Parent-Teacher Association, Secretary King Willliam Lunalilo Elementary School; Honolulu, Hawai'i
Aug. 2005	Volunteer Event Co-Chairperson, 3rd Annual Breastfeeding Fair at Agana Shopping Center; Hagåtna, Guam

L. Robert Barber, Jr.

CNAS/CES/ANR, UOG Station
Mangilao, Guam 96923
Tel: (671) 735-2080 Fax: (671) 734-5600

Email: bbarber@uguam.uog.edu

P.O. Box 5396, UOG Station
Mangilao, Guam 96923
(671) 734-2281

PROFESSIONAL EXPERIENCE:

Extension Agent IV, Extension Agricultural Economist
University of Guam – CNAS/CES/ANR, Mangilao, Guam July 1993 - Present

- Responsible for courses in agricultural and consumer economics and personal financial management.
- Extension/research in sustainable agriculture, information dissemination, management and marketing.

Instructor, Micro-Computer Courses
Athens Area Technical Institute - Economic Development Division, Athens, GA October 1988 - June 1993

- Developed curriculum and taught micro-computer and other courses on a contractual basis.

Consultant, Extension/Dissemination Specialist
USAID/Deloitte Touche: AGMARIS Project, Bureau of Agricultural Statistics, Philippines Mar. - Oct. 1992

- Responsible for the Extension portion of a National Agricultural Market Information System.

Research Assistant
University of Georgia - Agricultural Economics Department, Athens, GA October 1988 - March 1991

- Designed, programmed and documented the Georgia Whole-Farm Risk Analysis Program.

Extension Farm Business Advisor, Extension Farm Business Advisory Service
University of Georgia - Extension Agricultural Economics Dept., Athens, GA August 1987 - August 1988

- Consulted with farm families on business management for a one year demonstration program.

County Extension Agent, Small Landowners Information Project (SLIP)
Fort Valley State College - Cooperative Extension Program, Fort Valley, GA January 1986 - August 1987

- Counseled minority and financially distressed farmers in Southwest Georgia.

Peace Corps Volunteer, Uplands Community Development Program
Provincial Development Staff, Oriental Mindoro, Philippines August 1981 - May 1985

- Assigned to the tribe of Iraya Mangyans and managed their mountain farm school in Saclag, Mindoro.

EDUCATION:

University of Georgia, Athens, GA June 2011
Ph.D. in Adult Education.

University of Georgia, Athens, GA September 1988 - March 1991
Master of Science in Agricultural Economics. Focused on farm business planning and risk analysis from a subjective portfolio risk perspective. (2000 GRE 1390, 1984 GRE 1330, Overall GPA 3.57)

University of Georgia, Athens, GA September 1976 - March 1980
Bachelor of Science in Agriculture. Double major, Horticulture and Plant Pest Management.

University of Arizona, Tucson, AZ August 1974 - July 1976
Horticulture: Concentration in Greenhouse and Nursery Management under arid conditions.

Lowell Technological Institute, Lowell, MA August 1973 - August 1974
Physics

Woodstock Country School, S. Woodstock, VT June 1971 – August 1973
College Prepatory.

PUBLICATIONS: *Extension Publications, Journal Articles, Proceedings, CD-ROM and Computer Programs*

Rodriguez, J., Iriarte, I., Santos, J., Barber, L. R. (2006). *Chicken Tractors.* Guam Cooperative Extension pub. NF06-01. University of Guam, Mangilao, Guam.

Santos, J., Iriarte, I.Cruz, F., Barber, L. R. (2006). *Windbreaks.* Guam Cooperative Extension pub. NF06-03. University of Guam, Mangilao, Guam.

Santos, J., Iriarte, I., Mantanona, D. Barber, L. R. (2006). *Measuring Contour Lines: Building and Using an A-Frame.* Guam Cooperative Extension pub. NF06-02. University of Guam, Mangilao, Guam.

Barber, L. R., McConnell, J., Campbell, S., Denney M. J. (2000). *Portable Extension Office for Program Literature Exchange (PEOPLE)*: a CD-ROM organized by subject of publications for use in Extension education programs on tropical islands. University of Guam, Mangilao, Guam

Barber, B., Brown, J. (1999). *An Agricultural Production and Monitoring System for Islands.* South Pacific Commission Agricultural News. Secretariat of the Pacific Community, Suva, Fiji. 8(1) (June/July):16-17.

Barber, B., Brown, J., Artero, V. (1999). *Costs: Important Concepts in Understanding Production Costs.* Guam Cooperative Extension pub. MG701. University of Guam, Mangilao, Guam.

Barber, L. R., Crisostomo, D. P. (1999). *System Cost of a Small Recirculating Tank Aquaculture System.* Guam Cooperative Extension pub. AQ250. University of Guam, Mangilao, Guam.

Barber, L. R., Cruz, F. (1999). *Conserving Water in the Home and Yard.* Guam Cooperative Extension pub. WQ99_10. University of Guam, Mangilao, Guam.

Barber, L. R., Brown, J. W., Barcinas, P. (1999). *AG Telecom Web Page -V.3:* a CD-Rom telecommunications course for distance education. College of Agriculture and Life Sciences, Mangilao, Guam.

Cruz, F., Barber, L. R. (1998). *Postharvest Handling.* Guam Cucurbit Guide. Guam Cooperative Extension, University of Guam, Mangilao, Guam. pp 49-52.

Barber, L. R. (1998). *Developing Budgets.* Guam Cucurbit Guide. Guam Cooperative Extension, University of Guam, Mangilao, Guam. pp 53-56.

Moore, A., Brown. J. W., Barber, L. R. (1997). *A data Processing System for Monitoring Agricultural Production on US-affiliated Pacific Islands: An Access Database.* NMC. Saipan, CMNI.

Barber, B., Williams, A., Cruz, F., Pangelinan, M. (1997). *Problems and Issues in Guam's Agricultural Markets: An Overview.* The Pacific Rim Journal of Economics. Small Business Development Center,

Mangilao, Guam. 2(1)(March 1997):114-125.

Barber, L. R., Cruz, F. (1996). *Exports and Value Added Processing, Research and Extensions' Role in the Micronesian Region*, in Proceedings Enhancing The Role of Value Added Agriculture in Tropical Island Economies, Tropical and Subtropical Agricultural Research (TSTAR) Program of the Cooperative State Research Education and Extension Service, Kona Hawaii, pp. 55-59.

Barber, L. R., & ANR Unit (1995) *A Strategic Plan for Sustainable Agriculture on Guam.* Guam Cooperative Extension. University of Guam, Mangilao, Guam.

Barber, L. R., Rempillo, J., Aldave, M. A., Stuart, T. (1992). *Community and Trade Center Price Bulletin Boards.* Ag. Marketing Training Bulletin Series; Bureau of Agricultural Statistics, Manila, Philippines.

Barber, L. R. (1991). *Whole Farm Planning With Risk Considerations: A Farm Level Approach.* Masters Thesis, University of Georgia, Athens GA

Barber, L. R., McKissick, J., Reid, D. (1990). *Georgia Whole-Farm Risk Analysis Program* (G-WRAP). Proceedings of the 3rd International Conference on Computers in Agricultural Extension Programs, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL; pp. 411-416

GRANTS:

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Plan Implementation in Sustainable Agriculture.* 1-year, 2006-2007, $12,000.

Principal investigator – USDA, Natural Resource Conservation Service (NRCS) Conservation Innovation Grant (CIG), *Sustainable Conservation Innovation and Education for New Tropical Island Farms through Intra-agency Collaboration (SCIENTIFIC),* 2- year 2005-2007. $512,950.

Curriculum Development/Training – Sanctuary, Inc. / Administration for Native Americans (ANA), *Fan Macho'cho Healing farms project*, 2-year 2005-2007. $24,600.

Guam Project Coordinator – USDA, Western Region Sustainable Agriculture Research and Education via University of Hawaii, *New Farmer: Taking the Road Less Traveled.* 1-year, 2005-2006, $8,000.

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Plan Implementation in Sustainable Agriculture.* 1-year, 2005-2006, $16,000.

Co-Principal investigator – Guam EPA, *Guam Yard: Conservation in Urban Landscapes,* 3-year 2005-2008. $32,000.

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Plan Implementation in Sustainable Agriculture.* 1-year, 2004-2005, $19,000.

Co-principal investigator - USDA, Agricultural Development in the American Pacific (ADAP). *Portable Extension Office for Program Literature Exchange (PEOPLE) Project Extension Funds.* 1 - year 2000 - 2001. $14,600

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide*

Strategic Plan Implementation in Sustainable Agriculture. 1-year, 2000-2001, $10,000.

Co-principal investigator - USDA, Western Region Sustainable Agriculture Research and Education. *Portable Extension Office for Program Literature Exchange (PEOPLE).* 1 - year 1999-2000. $41,360

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Plan Implementation in Sustainable Agriculture.* 1-year, 1999-2000, $9,500.

Co-principal investigator - USDA, Western Region Sustainable Agriculture Research and Education. *Tools for Sustainability: Sustainable Agriculture Video Training Tapes for the Pacific Islands Region.* 2 yr. 1998-2000. $67,400.

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Plan Implementation in Sustainable Agriculture.* 1-year, 1998-1999, $9,000.

Co-principal investigator - USDA, Natural Resource Conservation Service (NRCS). *EQUIP Farm Record Keeping Training for Farmers on Guam and American Samoa.* 1- year, 1998-99. $14,500.

Instructional design: Team member - USDA, Agricultural Telecommunications. *Linking up in the Pacific to Revitalize Small Scale Agriculture Through Distance Education.* 1-year, 1997-1998, $130,382.

Co-principal investigator - USDA, Natural Resource Conservation Service (NRCS). *EQUIP Farm Record Keeping Training for Farmers on Guam and American Samoa..* 1- year, 1997-98. $8,050.

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Plan Implementation in Sustainable Agriculture.* 1-year, 1997-1998, $10,000.

Co-principal investigator - USDA, Western Region Sustainable Agriculture Research and Education. *On-Farm Implementation of Sustainable Management Systems for Tropical Agriculture in the Western Pacific Region: Year Two Training.* 1 year, 1996-1997, $63,623.

Co-principal investigator - USDA, Agriculture Development in the American Pacific (ADAP) *On-Farm Implementation of Sustainable Management Systems for Tropical Agriculture in the Western Pacific Region: Supplement.* 1 year, 1996-1997, $22,500.

Co-principal investigator - USDA, Agriculture Development in the American Pacific (ADAP). *Market Information Systems for the American Affiliated Pacific.* 4- years, 1996-1998, $172,000.

Project Coordinator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Plan Implementation in Sustainable Agriculture.* 1-year, 1996-1997, $11,000.

Economic analysis - USDA, Hatch *Tropical Mushroom Production with Used Paper, Sewage Sludge and Leucaena Sp. Wood Chips.* 3-year, 1995-1998, $92,000.

Co-principal investigator - Guam Economic Development Authority (GEDA). *Demonstration of an Intensive Recirculating Commercial Tilapia Production System.* 1 year, 1995-1996, $25,000.

Co-principal investigator - University of Guam Research Council. *Guam Crop Yield Studies and Coordination.* 6 months, 1994, $2,500.

Principal investigator - USDA, Western Region Sustainable Agriculture Research and Education. *Statewide Strategic Planning in Sustainable Agriculture.* 1-year, 1993-1994, $10,000.

COMMITTEES:

Member, University of Guam Faculty Senate (elected 2008-2010)
Division Chair, Cooperative Extension Division (elected 2006-2008)
Chair, University of Guam Faculty Union/Board of Regents Salary Negotiation Committee (2001)
Chair, University of Guam Promotion and Tenure Committee, (elected Chair for AY 2000/01)
Member, Chamorro Village Vendor Selection Committee (appointed 1994-2001)
Member, Chamorro Land Trust, Ag. Advisory Committee (appointed 1996-2001)
Chair, Western Region Coordinating Committee 67 for Sustainable Agriculture 1999 (Tucson)
Member, University of Guam Promotion and Tenure Committee (elected AY 1999/2001)
Member, College of Agriculture and Life Sciences Curriculum Committee (elected 1999/2000)
Member, College of Agriculture and Life Sciences Computer Committee (elected 1999/2000)
Chair, UOG WASC Standard 6 Accreditation Committee: Library and Learning Resources (1998-2000)
Member, UOG WASC Standard 4 Accreditation Committee (1998-2000)
Acting Chair, Western Region Coordinating Committee 67 for Sustainable Agriculture 1999 (Reno)
Member, College of Agriculture and Life Sciences, College Restructuring Committee (appointed 1998/1999)
Member, Search Committee Member (appointed CRD Agent II - 1998)
Member, Board of Directors, United Aklan Families of Guam (elected 1997/98 1998/99)
Member, University of Guam Academic Affairs Committee, (elected AY 1997/98 1998/99)
Member, University of Guam Program Review Committee, (elected AY 1995/96 1996/97 1997/98)
Chair, College of Agriculture and Life Sciences Computer Committee (elected 1996-1999)

ANDREA L. BLAS, PH.D.

Assistant Professor, Plant Pathology
University of Guam
College of Natural & Applied Sciences
Western Pacific Tropical Research Center
Mangilao, GU 96923
Office: (671) 735-2140
Fax: (671) 734-4600
ablas@triton.uog.edu

EDUCATION

University of Hawaii, Manoa
Honolulu, HI 96822
Ph.D., Molecular Biosciences and Bioengineering
Specialization: Plant Molecular Genetics and Genomics
Dissertation: Molecular genetic basis of fruit size and flesh color in *Carica papaya*
December 2008

Humboldt State University
Arcata, CA 95521
B.S., Biology
Concentration: Environmental Biology
Senior Project: Construction and comparison of sand dune profiles in areas of native or invasive beach grasses at The Nature Conservancy, Humboldt Bay, CA
May 1998

TEACHING EXPERIENCE

August 2015 – present
University of Guam
College of Natural & Applied Sciences
Western Pacific Tropical Research Center
Mangilao, GU 96923

Assistant Professor - Plant Pathology
AG 323 - Plant Pathology

August 2013 – May 2014
University of Guam
College of Natural & Applied Sciences
Natural Sciences Division
Mangilao, GU 96923

Assistant Professor - Biology
BI 100 – Environmental Biology
BI 100L – Environmental Biology Lab

RESEARCH EXPERIENCE

June 2015 - present
University of Guam
College of Natural & Applied Sciences
Western Pacific Tropical Research Center
Mangilao, GU 96923

Assistant Professor – Plant Pathology
Applied research and extension outreach on development and evaluation of virus disease tolerant papaya varieties for local growers. Basic research including genetic characterization of virus disease tolerance in papaya; soil microbial community dynamics in organic cropping systems in the tropics.

October 2009 – September 2012
Center for Research in Agricultural Genomics (CRAG)
Edifici CRAG – Campus de la UAB
08193 Bellaterra (Cerdanyola del Vallès)
Spain

Research Associate – Genomics & Biotechnology
Development of SNP genetic markers using next-generation sequence data for transfer to peach breeding and research programs. Constructed multiplexed sample libraries for sequencing and genotyping on 454 GS FLX (peach) and Illumina GA (octaploid strawberry) platforms. Collaborated with bioinformaticians to characterize putative SNPs for sequence homologies, repetitive element content, genome location, etc. using commercial and in-house bioinformatic tools and programs.

January 2009 – September 2009

Hawaii Agriculture Research Center
Waipahu, HI 96797

Post-doctoral Research Associate - Genomics & Pathology
Managed high-throughput shotgun sequencing efforts with collaborators from the University of Illinois and Texas A & M University for the papaya genome project. Constructed shotgun sequencing libraries, prepared high-throughput sequencing reactions and assembled BAC sequences with additional primer walking. Propagated aud maintained papaya mutant populations for genomic analysis using classical plant breeding techniques.

November 2000 – August 2004

USDA – Agricultural Research Service

Beltsville Agriculture Research Center
Beltsville, MD 20705

Dale Bumpers National Rice Research Center
Stuttgart, AR 72160

Lab Manager – Molecular Plant Breeding
Lab Manager – Molecular Plant Pathology
Supported plant breeding and plant-pathogen interaction research programs in Solanaceaeous crops and rice. Laboratory duties included DNA and RNA isolation, population genotyping, gene expression analysis, quality component analysis by HPLC and isolation and maintenance of fungal pathogen collections. Routinely conducted pathogen virulence and plant disease resistance assays. Assisted with tissue culture, greenhouse and field evaluation of breeding populations. Provided hands-on training and supervision to high school, undergraduate and graduate student interns.

February 1999 – August 2000

University of Guam
College of Agriculture & Life Sciences
Mangilao, GU 96923

Research Assistant – Turfgrass Science
Research Assistant – Plant Physiology & Pomology
Provided technical assistance in plant physiology and turfgrass science programs. Assisted in greenhouse and field data collection. Duties included data entry, sample processing and preparation of audio/visual materials. Designed and maintained college web site.

SERVICE TO UNIVERSITY

Land Use Committee (chair), University of Guam, Agriculture and Life Sciences. August 2015 - present.
Facilities Committee (member), University of Guam, Agriculture and Life Sciences. October 2015 - present.
Curriculum Committee (member), University of Guam, Agriculture and Life Sciences. September 2015 - present.

SERVICE TO COMMUNITY

Haggan Watch –Data collection and monitoring of sea turtle nesting sites in Guam. April 2014 – present.
Guam Community Coral Reef Monitoring Program – Data collection in Guam's near-shore coral reefs. August 2013 – present.
Aloha Aina Coffee Farm – On-farm training for harvesting, processing and sales of estate coffee in Kailua-Kona, HI. September 2012 – January 2013.
Science Fair – Volunteer judge for Science Fair competitions at various elementary, middle and high schools in California, Maryland, Hawaii and Guam. 1997 – present.

HONORS AND AWARDS

The Honor Society of Agriculture, Gamma Sigma Delta: Award of Merit 2008.

Achievement Rewards for College Scientists (ARCS) Foundation: ARCS Award in Tropical Agriculture 2008.

PUBLICATIONS

Book Chapters

Ming, R., Q. Yu, **A. Blas**, C. Chen, J.-K. Na and P.H. Moore. 2008. Genomics of papaya, a common source of vitamins in the tropics. *In:* Ming, R. and P.H. Moore (eds). Plant Genetics/ Genomics: Genomics of Tropic Crop Plants. pp. 405-420. Springer Science+Business Media, LLC., New York, NY, USA.

Journal Articles

Verde, I., N. Bassil, S. Scalabrin, B. Gilmore, C. Lawley, K. Gasic, D. Micheletti, U. Rosyara, F. Cattonaro, E. Vendramin, et al. 2012. Development and evaluation of a 9K SNP array for peach by internationally coordinated SNP detection and validation in breeding germplasm. PLoS ONE 7(4): e35668. doi:10.1371/journal.pone.0035668

Blas, A.L., Q. Yu, O.J. Veatch, R.E. Paull, P.H. Moore and R. Ming. 2011. Genetic mapping of quantitative trait loci controlling fruit size and shape in papaya. *Molecular Breeding* DOI 10.1007/s11032-011-9562-1.

Blas, A.L., R. Ming, Z. Liu, O.J. Veatch, R.E. Paull, P.H. Moore and Q. Yu. 2010. Cloning of the papaya chromoplast-specific lycopene β-cyclase, *CpCYC-b*, controlling fruit flesh color revealed conserved microsynteny and a recombination hotspot. *Plant Physiology* 152: 2013-2022.
Blas, A.L., Q. Yu, C. Chen, O. Veatch, P.H. Moore, R.E. Paull and R. Ming. 2009. Enrichment of a papaya high-density genetic map of AFLP markers. *Genome* 52 (8): 716-725.

Paull, R.E., B. Irikura, P. Wu, H. Turano, N.J. Chen, **A. Blas**, J.K. Fellman, A.R. Gschwend, C.M. Wai, Q. Yu, et al. 2008. Fruit development, ripening and quality related genes in the papaya genome. *Tropical Plant Biology* 1: 246-277.

Ming, R., S. Hou, Y. Feng, Q. Yu, A. Dionne-Laporte, J. H. Saw, P. Senin, W. Wang, B. V. Ly, K. L. T. Lewis, et al. 2008. The draft genome of the transgenic tropical fruit tree papaya (*Carica papaya* Linnaeus). *Nature* 452:991-996.

Yu, Q., S. Hou, R. Hobza, F.A. Feltus, X. Wang, W. Jin, R.L. Skelton, **A. Blas**, C. Lemke, J. H. Saw, et al. 2007. Chromosomal location and gene paucity of the male specific region on papaya Y chromosome. *Molecular Genetics and Genomics* 278:177-185.

Marler, T.E., R. dela Cruz and **A.L. Blas**. 2002. Iron deficiency induced changes in iron reductase activity in papaya roots. *Journal of the American Society of Horticultural Science* 127(2): 184-187.

PRESENTATIONS

Professional Conferences

Blas, A.L., R. Ming, P.H. Moore, R.E. Paull, Q. Yu. 2009. Genomic analysis of the chromoplast-specific lycopene beta-cyclase gene, *CpCYC-b*, revealed a recombination hotspot in papaya. American Society of Plant Biologists, Plant Biology 2009, Honolulu, Hawaii, July 18 – 22, 2009. Abstract #P65017.

Blas, A.L., R. Ming, P.H. Moore, R.E. Paull, Q. Yu. 2008. Papaya fruit flesh color is determined by gene expression and functional activity of a chromoplast-specific lycopene β-cyclase, *CpCYC-b*. American Society of Plant Biologists, Plant Biology 2008, Merida, Mexico, June 26 – July 1, 2008. Abstract #P07010.

Blas, A.L., Q. Yu, B. Sipes, R. Ming and S. Miyasaka. 2006. Green manure effects on soil microbial community in a root-knot nematode (*Meloidogyne javanica*) control system in taro (*Colocasia esculenta*). American Society of Agronomy – Crop Science Society of America – Soil Science Society of America, ASA-CSSA-SSSA 2006 International Annual Meetings, Indianapolis, Indiana. November 12-16, 2006. Abstract #37-8.

Jia, Y., B. Valent and F.N. Lee. 2002. Uniform infection and determination of host responses to *Magnaporthe grisea* on detached rice leaves using spot inoculation. 29th Rice Technical Working Group, Little Rock, AR. February 24-27, 2002. p. 93.

University/College

Blas, A.L., R. Ming, P.H. Moore, R.E. Paull, Q. Yu. 2008. Molecular genetic basis for papaya fruit flesh color: cloning and characterization of a chromoplast-specific lycopene beta-cyclase gene in papaya. University of Hawaii, CTAHR Student Research Symposium 2008, Honolulu, HI, April 11-12, 2008. Abstract #85.

Blas, A.L., Q. Yu, B. Sipes, S.C. Miyasaka and R. Ming. 2007. Green manure effects on soil microbial communities in a root-knot nematode control system in taro. University of Hawaii, CTAHR Student Research Symposium 2007, Honolulu, HI, April 5-6, 2007. Abstract #34.

Resume of **Hauhouot Diambra-Odi**
213 Chalan Dok Dok
Yigo, Guam, 96929 (USA)
Telephone: (671) 653-1466
Cell: (671) 486-5613
E-mail: hdiambraodi@gmail.com

OBJECTIVE:

To provide leadership and support in science education, research and curriculum development in higher education.

PROFESSIONAL EXPERIENCE:

College of Natural and Applied Sciences, WPTRC/CariPac, UOG, Mangilao, Guam (2014-Present). Associate Professor (Agriculture Education, Nutrition & Health and Animal Science). Involved in student recruitment and advisement, teaching and research.

College of Natural and Applied Sciences, WPTRC, UOG, Mangilao, Guam (2012-2014). Consultant, Edag Services and Adjunct Faculty (Nutrition and Health, Advanced Nutrition and Human Metabolism, Microbiology Lab).

St. Thomas Aquinas Catholic High School, Ordot, Guam (2008-2012). High School Founding Principal and Teacher (Career Interests and Marine Biology)

St. John's School, Tumon, Guam (2007-2008). Secondary School Principal

St. John's School, Tumon, Guam (1998-2007). Science teacher. Have taught general biology, IBH/AP biology, biotechnology, anatomy and physiology, chemistry, nutrition and health, from grades 9 to 12.

College of Agriculture and Life Sciences, University of Guam (1998-1999). Research Associate in Entomology. Duties included research data analysis and reporting, conference proceedings and agricultural extension publications in collaboration with Dr. R. Muniappan. Adjunct faculty teaching nutrition and health.

College of Agriculture and Life Sciences, University of Guam, Mangilao, Guam. (1992-1998). Research Associate at the College of Agriculture and Life Sciences. Collaborating with Dr. F.G. Abawi on two USDA-406 projects evaluating potential feed resources for livestock and poultry in Micronesia. Responsibilities included computer feed formulation, chemical analyses of feed, energy metabolism, cholesterol assay in eggs and organs, designing and conducting feed trials, performing statistical analysis and reporting results. Other duties included conducting workshops for farmers and setting up field demonstrations in the areas of poultry management, artificial insemination of poultry and

waste management. Teaching assignment included: Introduction to animal science (anatomy and physiology), animal nutrition (nutrient compound and elements, function of nutrients, physiology of digestion and metabolism), animal science (lectures and labs) and human nutrition and health. Involved in preparing curricula of graduate courses in environmental science. Have initiated outreach program with the community in recycling waste material and poultry manure. Have conducted several lectures and tours to elementary and secondary education students at the agricultural experiment station.

National College of Agriculture, Abidjan/Yamoussoukro, Ivory-Coast (1985-1992). Assistant Professor (1985), Associate Professor (1987) and Professor (1990) in Animal Science. Served as Chairman of the Animal Science Department from 1988 to 1992. Assumed responsibilities in locating funds and implementing research projects, coordinating faculty research team, managing the animal research facilities and teaching undergraduate and graduate courses in animal science, anatomy and physiology of vertebrates, pasture management and productivity, animal nutrition and economics of animal production. Research interests included establishment of feeding standards for the tropics, by-product digestibility of ruminant animals with cannulae, and multidisciplinary approach to study sustainable agricultural systems such as integrating sheep and vegetable crops into a rotation. Served as resident instructor for graduate students majoring in animal science. Actively involved in preparing curricula for animal science graduate programs. Have obtained financial assistance from US-AID to lead eleven graduate students from Ivory Coast to visit agricultural facilities at three USA Universities. Served as advisor for several students preparing for their Master of Science.

Animal Nutrition Central Laboratory, Abidjan, Ivory-Coast (1985-1992). Joint Appointment in Extension. Duties included review and evaluation of chemical feed analyses, provided technical assistance in feed formulation to livestock and poultry farmers and monitoring feed quality of the feed industry. Laboratory services included: proximate analysis (dry-matter, protein, fat, fiber, ash and nitrogen free extract), ADF and ADL, mineral analysis, energy metabolism and digestibility (nylon bags and "in vitro").

Food and Agriculture Organization (FAO), Abidjan Office, Ivory-Coast (1985). Worked as a consultant for local FAO office on economical and technical evaluation of Noroningue Breeding Cattle Farm in Northern Ivory-Coast (Project N0 TCP/IVC/45-04 1985)

African Development Bank (ADB), Abidjan, Ivory-Coast (1989 and 1990). Worked as consultant for ADB on two projects: economic and technical feasibility study for the expansion of Algeria's feed industry and prospects of animal production in newly irrigated farmlands in Doukkala County, Morocco.

Winrock International, Abidjan Office, Ivory-Coast (1990). Worked as a consultant for the Regional Workshop for Western and Central Africa on Animal Agriculture held in Abidjan, Ivory-Coast.

International Atomic Energy Agency (IAEA)/ Food and Agriculture Organization (FAO) Joint Laboratory, Seibersdorf, Austria (April-May 1987). Post-doctoral fellow at the Animal Science Laboratory. Investigated forage digestibility comparing three methods: rumen simulated technique ("Rusitec"), nylon bags and "in vitro" technique.

University of Georgia, Athens, Georgia (1981-1984). Research Assistant in the Department of Poultry Science. Worked under Dr. Gene Pesti in computer modeling involving linear and quadratic programming and computer feed formulation.

Peterson's Farm, Inc., Decatur, Arkansas (1980). Summer training in hatchery management, feed mill processing, poultry meat processing, mass selection of broiler breeder males, and laboratory quality control.

Sodepra (Animal Production Development Project), Ivory-Coast (1978). Summer training involving extension work on beef and dairy cattle farming and management of beef cattle ranch.

TEACHING EXPERIENCE:

High School: General Biology, IB/AP Biology, Biotechnology, Human Anatomy and Physiology, Chemistry, Nutrition and Health, Marine Biology, Career Interests.

University:

- Undergraduate: Anatomy and Physiology of Vertebrates, Principles of Animal Science, Nutrition and Health, Advanced Nutrition and Human Metabolism, General Microbiology Lab, Biochemistry Lab, Climate Change and the Pacific Islands (Online-Hybrid Delivery)
- Graduate: Pasture Management and Productivity, Economics of Animal Production, Poultry Science

EXPERIENCE IN CURRICULUM DEVELOPMENT:

INPRAT: Developed a comprehensive curriculum of the first Private Agricultural Vocational College in West Africa (INPRAT, 1987)

St. Thomas Aquinas Catholic High School: Developed a comprehensive curriculum for the newest Archdiocesan Catholic School on Guam (STA, 2008)

College of Natural and Applied Sciences, University of Guam: Developed a graduate program proposal (Master of Science in Sustainable Agriculture, Food and Natural Resources) for approval by the University (2014)

College Online Course Development: Principles of Animal Science (2014) and Sustainable Animal Production Systems (for proposed MS Program) (2015)

EDUCATION:

Completed an Online Education Course on "Supervision and Instructional Leadership" from Grand Canyon University, Phoenix, Arizona (2007).

Postdoctoral fellow at the International Atomic Energy Agency (AIEA) Laboratory in Seibersdorf, Austria (Summer 1987). Training involved forage digestibility for ruminants using nylon bags and rumen simulated technique (Rusitec) and use of radioactive tracer in digestibility trials.

Ph.D in Poultry Science with emphasis on management and nutrition from the University of Georgia, Athens, from 1981 to 1984. Research focused on investigating broiler performance as affected by feeding practices.

Master of Science in Animal Industries with emphasis on farm animal reproductive physiology from Southern Illinois University at Carbondale from 1979 to 1981. Research thesis was on evaluation of forced molt methods in layers.

Bachelor of Science in Agricultural Science and Engineering, with emphasis in chemistry, general biology, agronomy, agro-forestry, plant pathology, agricultural economics and anatomy and physiology of vertebrates from the National College of Agriculture, Ivory-Coast. Internship and research report focused on beef cattle production and rural development in Touba and Seguela Counties in Ivory-Coast. The four-year program was divided into two years in Chemistry and Biological Sciences from the University of Abidjan (1974-1976) and two years in Agricultural Sciences and Engineering from the National College of Agriculture, Abidjan, Ivory-Coast (1976-1978).

BOOK PUBLICATIONS:

1. Tropical Broiler Chicken Management Guide, 2013. Published by Xlibris. ISBN: 978-1-4836-8885-5
2. Tropical Layer Chicken Management Guide: A Sustainable Approach, 2014. Published by Xlibris. ISBN: 978-1-4931-8555-9

LIST OF PUBLICATIONS:

Abawi, F.G. and O.H. Diambra. 1993. Local limestone as a source of calcium for laying hens on Guam. Micronesica 26 (2): 139-145.

Abawi, F.G. and O.H. Diambra. 1993. *Leucaena* leaf meal and local limestone in the diet of laying hens. Micronesica 26 (2): 147-153.

Abawi, F.G. and O.H. Diambra. 1997. Enzyme and amino acid supplementation of *leucaena* leaf meal-based diet for broiler chicks. Micronesica 30 (2): 429-434.

Bamba J., J. A. Cruz, O.H. Diambra and R. Muniappan. 1999. Head cabbage variety study for tipburn resistance. Papua New Guinea Journal of Agriculture, Forestry and Fisheries 42:5-6

Diambra, O.H. 1981. An evaluation of forced molt methods in layers. M.S. Thesis. Southern Illinois University, Carbondale, Il.

Diambra, O.H. 1984. Broiler performance as affected by feeding systems. Ph.D. Dissertation. University of Georgia, Athens, Ga.

Diambra, O.H., N. Alla and V.N. Djan. Coffee hulls in feedlot for lambs. Accepted for Publication. Bull. Anim. Hlth. Prod. Afri.

Diambra, O.H., K.K. Bini and G. Kadio. 1989. Cassava chips as energy source for weaned lambs. Bull. Anim. Hlth. Prod. Afri. 37: 285-289.

Diambra, O.H., M. Coulibaly and Z. N'guessan. 1998. Efect of palm oil and its energy content on the growth of pigs. Bull. Anim. Hlth. Prod. Afri. 36: 132-136.

Diambra, O.H. and M.G. McCartney. 1985. Performance of male broilers changed from starter to finisher diets at different ages. Poultry Science 64: 1829-1833.

Diambra, O.H. and M.G. McCartney. 1987. Effect of feed restriction on growth rate and abdominal fat of broilers. Bull. Anim. Hlth. Prod. Afri. 35: 25-28.

Diambra, O.H., N.Z. N'guessan, M. Coulibaly and D. Zongo. 1990. Lysine supplementation of cottonseed meal-based diet for broilers. Bull. Anim. Hlth. Prod. Afri. 38: 419-423.

Diambra, O.H., D. Zongo and S. Mohamed. 1989. Feeding rabbits with mash in Ivory-Coast. Agronomie Africaine 1 (2): 125-129.

Goodman, B.L., R.A. Norton, Jr. and O.H. Diambra. 1986. Zinc oxide to induce molt in layers. Poultry Science 65: 2008-2014.

Motavalli, P.P. and O.H. Diambra. 1997. Management of nitrogen immobilization from waste office paper application to tropical pacific island soils. Compost Science & Utilization 5 (3): 71-80.

N'guessan, N.Z., O.H. Diambra, D.Zongo and M. Coulibaly. 1989. Effect of dietary protein and energy level on chick growth, carcass yield and abdominal fat pad weight. Annales de Zootechnie (Elsevier) 38: 219-228

Zongo, D., M. Coulibaly, O.H. Diambra and E. Adjiri. 1990. Notes on African giant snail husbandry (*Achatina achatina*). Nature and Wildlife (FAO) 6 (2): 32-44.

Zongo, D., O.H. Diambra, A. Bledoumou, M. Coulibaly and A.V. Kipre. 1992. Cottonseed meal as a substitute for soybean meal in finishing diets for pigs. Agronomie Africaine IV (2): 157-164.

Zongo, D., C. Ba, O.H. Diambra and M. Coulibaly. 1997. Coloration effect of a natural source of pigment (*Leucaena leucocephala*) for use in poultry. Annales de Zootechnie (Elsevier) 46: 185-190.

EXTENSION AND PROCEEDINGS PUBLICATIONS:

Abawi, F.G. and O.H. Diambra. 1995. Pullet Management Guide. College of Agriculture and Life Sciences, University of Guam, Mangilao, Guam, 9 pp.

Abawi, F.G. and O.H. Diambra. 1995. Laying Hen Management Guide. College of Agriculture and Life Sciences, University of Guam, Mangilao, Guam, 9 pp.

Denton, G.R. W., R. Muniappan, L. Austin and O.H. Diambra. 1999. Fruit-Piercing Moths of Micronesia. Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam, 26 pp.

Diambra, O.H. 1995. Artificial Insemination of Poultry. College of Agriculture and Life Sciences, University of Guam, Mangilao, Guam, 4 pp.

Muniappan, R., L. Austin and O.H. Diambra. 1999. Editors of "Proceedings of the First Regional Workshop on Plant Quarantine. June 17-21, 1996. University of Guam, Mangilao, Guam,

VARIOUS NEWSPAPER AND MAGAZINE REFERENCES:

Broiler growth not harmed by restriction during 3-6 weeks. In: *Poultry Digest* (Research Review). April 1984, p. 170.

Low protein, more fat. In: *Poultry Digest* (Research Review). September 1984, p. 379.

Changing from starter to finisher diets at different ages on broilers. In: *Animal Nutrition Research Highlights* (American Soybean Association). March 1986, p. 5.

Sustaining the soil. In: *Pacific Sunday News* (Gardening section). November 20, 1994, p. 48.

Military, private sector recycle waste. In: *Guam Business News*. April 1995, p. 101.

Navy secrets, manure mixed. In: *Pacific Stars and Stripes*. Feb. 24, 1995, p. 6.

EXTENSION RADIO SHOWS (Public Radio for Guam KPRG): Interviewed by Linda Austin, Media Specialist.

"Forced molting your chickens." May 4, 1994.

"Design tips for chicken houses." May 19, 1994.

"Wastelage": silage of poultry waste. December 15, 1994.
"Chicken houses." March 21, 1995.

"Artificial insemination of poultry." December 5, 1995.

"Chicken houses." February 29, 1996.

CONFERENCE PRESENTATIONS (Proceedings and Abstracts):

Abawi, F.G. and O.H. Diambra. 1993. Evaluation of dry extruded tropical feed mixture on broiler performance. Abstracts. PS 72 Suppl. 1 p. 124. MSU, East Lansing, Mi.

Abawi, F.G. and O.H. Diambra. 1993. *Leucaena* leaf meal and crushed coral in the diet of laying hens. Abstracts. PS 72 Suppl. 1 p. 125. MSU, East Lansing, Mi.

Abawi, F.G. and O.H. Diambra. 1993. Crushed coral of Guam as a source of calcium for laying hens. Abstracts. PS 72 Suppl. 1 p. 126. MSU, East Lansing, Mi.

Abawi, F.G. and O.H. Diambra, 1994. Effect of varying calorie and protein levels on layers fed high level of *leucaena* leaf meal. Abstracts. PS 73 Suppl. 1 p. 50. MSU, Starksville, Ms.

Abawi, F.G. and O.H. Diambra. 1994. Effect of fiber and feed restriction on body weight and onset of sexual maturity of pullets. Abstracts. PS 73 Suppl. 1 p. 53. MSU, Starksville, Ms.

Abawi, F.G. and O.H. Diambra. 1994. True metabolizable energy value of dry extruded *leucaena*, cassava and copra meals. Abstracts. PS 73 Suppl. 1 p. 88. MSU, Starksville, Ms.

Abawi, F.G. and O.H. Diambra. 1994. Effect of enzyme and animo acid supplementation of *leucaena* leaf meal diet on broilers. Abstracts. PS 73 Suppl. 1 p. 95. MSU, Starksville, Ms.

Abawi, F.G. and O.H. Diambra. 1996. Effect of cellulose on broilers fed high fiber diet. Abstracts. PS 75 Suppl. 1 p. 37. The Galt House, Louisville, Ky.

Abawi, F.G. and O.H. Diambra. 1996. Long term effect of feeding *leucaena* leaf meal on egg production. Abstracts. PS 75 Suppl. 1 p. 37. The Galt House, Louisville, Ky.

Abawi, F.G. and O.H. Diambra. 1997. Evaluation of *leucaena* and alfalfa-based diets with cellulase enzyme on broiler performance. Abstracts. PS 76 Suppl. 1 p. 78. UGA, Athens, Ga.

Coulibaly, M. and O.H. Diambra. 1985. Evaluation of "glandless" cottonseed meal for broilers. In: *Proceedings* International Meeting on "Glandless" Cottonseed (Compagnie Ivoirienne pour le Development des Textiles). Abidjan, Ivory-Coast.

Coulibaly, M. and O.H. Diambra. 1988. Effect of processing methods on the nutritional value of fish meal. In: *Proceedings* Fourth FAO Expert Consultation on Fish Technology in Africa. African Development Bank, Abidjan, Ivory Coast.

Diambra, O.H. 1990. Evaluation of non conventional feed ingredients for back yard poultry: snail meal, earthworms and termites. In: *Proceedings* Small Holder Rural Poultry Production (EEC/ACP). Thessaloniki, Greece.

Diambra, O.H. 1994. Animal waste characteristics. In: *Proceedings* Animal Waste Symposium. USDA-Natural Resources Conservation Service. Dec. 1-2, 1994. Guam.

Diambra, O. H. 2014. Enhancing STEM through Sustainable Agriculture Education. CIS Regional Island Sustainability Conference, Guam Hyatt Hotel.

Diambra, O. H. 2007. Using "Eat Right Analysis" software to promote healthy eating habits among school children. EARCOS Teacher's Conference, Bangkok, Thailand.

Diambra, O.H., F.G. Abawi and J.Y. Mbaiasbe. 1993. Assessing calorie and protein requirements of laying hens under tropical conditions. Abstracts. PS 72 Suppl. 1 p. 74.

Diambra, O.H. and M. Coulibaly. 1989. Lysine supplementation of cottonseed meal-based diet for broilers. In: *Proceedings* Poultry Production in hot Climate (EEC/ACP). Hamelm, Fed. Rep. Germany.

Diambra, O.H., M. Coulibaly, D. Zongo, J.V. Malderen and M. Zouzoua. 1991. Effect of dose and withdrawal time of salinomycine on broiler performance and intestinal lesions. Abstracts. PSA 70 Suppl. 1 p. 36. Texas A&M, College Station, Tx.

Diambra, O.H. and M.G. McCartney. 1984. Effect of feed restriction on growth rate and abdominal fat of broilers. SPSS Abstracts. World Congress Center, Atlanta, Ga.

Diambra, O.H. and M.G. McCartney. 1984. The effect of low protein finisher diets on broiler males' performances and abdominal fat. Abstracts. PS 73rd Annual Meeting, p. 91. University of Guelph, Guelph, Ontario, Canada.

Motavalli, P. P. and O. H. Diambra. 1994. Animal waste utilization alternatives. P. 50-52. In: *Proceedings* Animal Waste Symposium. USDA- Natural Resources Conservation Service. Dec. 1-2, 1994. Guam.

CONFERENCES, WORKSHOPS AND SEMINARS:

Breeders Roundtable, St. Louis Missouri. 1980.

Georgia Nutrition Conference, Atlanta Georgia. 1982, 1983, 1984.

Seminar on Sheep and Goat Meat under Humid and Tropical Africa, Yamoussoukro, Ivory-Coast. 1987 (FAO).

Workshop on Sub regional Co-operation on Livestock Development in West-Africa: Increasing Animal Food Availability through Prevention, Reduction and Elimination of Losses and Waste, Ouagadougou, Burkina Faso. 1988 (UN/ECA).

Cattle Milk and Meat in Africa: Collaborative Research Workshop, Ibadan Nigeria. 1988 (ILCA).

Consulting Capability in Africa: National Workshop of Consultants from Ivory-Coast, Abidjan. 1988 (World Bank).

Animal Agriculture: Regional Workshop for Western and Central Africa, Abidjan Ivory-Coast. 1990 (Winrock International).

EARCOS Teachers' Conference: Manila, Philippines. March 2006. (East Asia Regional Council of Schools)

International Baccalaureate (IB) Workshop: Florida League of International Baccalaureate, St. Petersburg, Florida. 2006.

EARCOS Teachers' Conference: Bangkok, Thailand. March 2007

Leadership for International Education Seminar. Triangle Associates of St. Louis, Missouri. Kuala Lumpur. March 25-26, 2008.

Association of Supervision and Curriculum Development (ASCD) Conference, San Francisco, CA. March 2011

ASCD Pre-Conference: Project-Based Learning, San Francisco, CA. March 2011

UOG School of Education: Educators' Summit 2011. Theory to Action: Making it Happen (October 21, 2011, Hotel Nikko, Guam)

BASTA (Bullying Affects Students, Teachers and All). Hosted by the Judiciary of Guam and Guam Department of Education (October 25-27, 2011, Hyatt Regency Guam)

GRANTS COMPLETED:

Travel Grant:

US-AID grant and the office of the President of the Ivory-Coast, to lead eleven graduate students from the Ivory-Coast to visit three US Universities (University of Georgia, Auburn University, and Tuskegee University) and various animal industries (1986).

Principal Co-Investigator:

Special Grant from the Office of the President of the Ivory-Coast (1985-1989). Funds were allocated to the investigation of local feed resources for animal feed in Western Africa.

Joint IAEA/FAO Project (1986-1990). Funds were allocated to research, equipments, training and travels relevant to digestibility studies of forages and agricultural byproducts for ruminants.

European Economic Community (1989-1990). Funds were allocated to conduct experiments on glandless cottonseed meal for poultry and swine.

USDA-406 Project on potential feed resources on Guam and Micronesia (1991-1994).

USDA-406 Project on the evaluation of high fiber diet for poultry (1995-1998).

OTHER COLLABORATIVE GRANTS AWARDED:

Duguies, M.V., E. Ioanis and O.H. Diambra. "People Improving Growth for Swine" (PIGS). SARE Western Region 1999.

Diambra, O. H. " One Thousand Trees for Guam". Guam Environmental Protection Agency. 2003-2004.

Diambra, O. H., Marutani, M. "Ecofeed" UOG Center for Island Sustainability (US Department of the Interior, Office of Insular Affairs' Technical Assistance Program). 2014-2017. Grant awarded: $ 377,956.

COLLABORATIVE RESEARCH AND COMMUNITY OUTREACH:

Established a site for farmers, landscapers and gardeners to collect several types of composted materials including waste office paper, yard waste, shredded Christmas trees and wooden pallets combined with poultry manure for soil amendments, in collaboration with the local US Navy, Guam Public Works and the USDA Natural Resources Conservation Service (1993-1996).

Involved in soil fertility testing with composted materials including poultry manure, in collaboration with Soil Scientist Peter Motavalli (1993-1994).

Served as resource contact for the Guam Farmers' Association in developing extruded products from restaurant waste in feeding swine (1993-1994).

Served as resource contact for the Recycling and Environmental Information Service at the University of Guam and for the Recycling Association of Guam (1994-1995).

Member, Institutional Animal Care and Use Committee, Office of Sponsored Programs, Graduate School, University of Guam, Mangilao, GU (2011- present)

PAST and PRESENT PROFESSIONAL AFFILIATIONS:

Poultry Science Association (USA).
Federation of Animal Science Societies (USA).
Animal Science Section Editor of "Agronomie Africaine" (Ivory-Coast).
Recycling Association of Guam (Guam, USA).
National Science Teacher Association (USA)
American Association of School Administrators (USA)
Association of Secondary School Principals (USA)
Association of Supervision and Curriculum Development (USA)
Who is Who Among American Teachers, Awards in 2004 and 2006
American Association of Agricultural Education (USA)

PERSONAL:

US citizen and Guam resident
Language proficiency in French and English
Asian Football Confederation "B" License. Soccer Coach and Head Coach of the University of Guam Soccer Club (1996-1998). Head Coach of Noka Oi Soccer Club (2003- 2006)
Co-founder and Consultant of a Vocational Agricultural College in the Ivory-Coast (INPRAT, Adzope: over 500 students)
Presidential Merit Scholarship Award (Ivory-Coast): Southern Illinois University at Carbondale, IL (1979-1981) and the University of Georgia, Athens, GA (1981-1984)
Contributor Panel Discussion, Human Watch International Film Festival (University of Guam)
Board Member (Pacific Christian Academy, Guam) (2003-2005)

SUMMARY OF STRENGTH:

- Team player
- Strong organizational skills
- Excellent interpersonal skills
- Extensive Research Publications in various International Journals (Poultry Science, Annales de Zootechnie, Micronesica, Bull. Anim. Hlth Prod. Afri., Agronomie Africaine, Compost Science & Utilization, Papua New Guinea J. of Agri., Forest. and Fisher.
- Over twenty five years of experience in education (high school and higher education combined)
- Experienced in pioneering new schools
- Enthusiastic and ready for new challenges.

REFERENCES:

Dr. Maika Vuki, College of Natural and Applied Sciences, University of Guam, Mangilao, Guam 96923.
E-mail: *mvuki@uguam.uog.edu*

Dr. Rachel Leon Guerrero, College of Natural and Applied Sciences, University of Guam, Mangilao, Guam 96923
Email: *rachaeltlg@gmail.com* or *rachaeltlg@uguam.uog.edu*

Dr. Jim McConnell, Professor, College of Natural and Applied Sciences, University of Guam, Mangilao, Guam 96923.
Email: *tinanum@mac.com* or *mcconnel@uog.edu*

Subir Ghosh, Ph.D.
Division of Natural Sciences, CNAS, Science Bldg. 223
University of Guam
E-Mail: sghosh@uguam.uog.edu
Telephone: (671) 735-2789

Curriculum Vitae

Education :

- Ph.D., University of California at Irvine; Molecular Biology & Biochemistry.
- B.Sc., M.Sc., Calcutta University, India; Biology - specialization in Cyto-Genetics.

Postdoctoral Training :

- Howard Hughes Medical Institute, University of California at San Francisco.

Professional Experience :

- 2014 - 2015 : Visiting Professor, Department of Cell Biology, Emory University School of Medicine, Atlanta, GA.
- 1999 - present: professor of Biology, Division of Natural Sciences, CNAS, University of Guam.
- Summer 2003 : Visiting Faculty, Tohoku University Graduate School of Medicine, Japan.
- Summer 2002 : Guest Scholar, Kyoto University Graduate School of Medicine, Japan.
- 1997 – 1999 : Research Scientist, Geraldine Brush Cancer Research Institute, CPMC, San Francisco.
- 1994 – 1996 : Research Scientist, Institute of Biotechnology, San Antonio, Texas.

Grants :

- NIH MBRS SCORE Biomedical Research Grant Award, University of Guam, 2001-2005; *$ 571,261.*
- NSF CCLI Award, Research-based Molecular Biology Course, University of Guam, 2001-2006; *$100,000.*
- Individual Research Grant Award, University of California AIDS Research Program, 1993-1995; *$120,000.*
- New Investigator Grant Award, Center for AIDS Research, San Francisco General Hospital, 1992-1993; *$50,000.*

Awards :

- Who's Who Among America's Teachers, 2005.
- Who's Who Among America's Teachers, 2004.
- College of Arts & Sciences Faculty Award for Excellence in Teaching & Research, University of Guam, Spring 2003.
- Texas Triangle Research Award for Outstanding Accomplishments, Texas Triangle Meeting in Molecular Medicine, University of Texas Health Science Center, San Antonio, 1995.
- Howard Hughes Medical Institute Postdoctoral Research Fellowship Award, UCSF, 1990-92.
- Tuition Fellowship Award, Ph.D. program, University of California, Irvine, 1984-89.

Membership :

- American Association for the Advancement of Science (AAAS).

Teaching & Course Development Accomplishments at the University of Guam (UOG)

At UOG, I have been the sole faculty responsible for teaching, and course curriculum & laboratory development and improvement for the molecular level courses listed below and that led to the successful modernization of the undergraduate Biology Program at the University of Guam.

BI 425/G & BI 425/G/L; Molecular Biology Lecture & Lab; Spring semester (odd years)

BI 419/G & BI 419/G/L; Biochemistry Lecture & Lab; Spring semester (odd years)

BI 416 & Bi 416L; Cellular Physiology Lecture & Lab; Spring semester (even years)

BI 225 & BI 225L; Microbiology Lecture & Lab; every Fall semester & Summer; for pre-nursing; pre-pharmacy; pre- veterinary; and Biology majors

BI 110 & BI 110L; Human Biology for non-majors; Fall 2000 to Fall 2006

I conduct the **Introductory Microbiology lab course** for pre-nursing and pre-pharmacy majors, who have a modest background in the sciences, using an inquiry-based cooperative learning approach. Details of the strategy and assessment methods that I take to initiate and motivate the students to perform a microbiology investigative project are provided in an assessment report.

I have designed the upper **division level Molecular Biology lecture and lab courses (focus on molecular medicine)** in a research project format, where biology major students learn molecular approaches and techniques and basic bioinformatics tools, in context to research problems that are presented at the beginning of the course. The student's present the results of their lab work project in scientific posters.

I conduct the **upper division level Cellular Physiology lab course** with an inquiry-based component. For example, biology major students first learn to isolate salivary glands from Drosophila and prepare polytene chromosomes. They then employ this system to test the effects of specific chemicals on the architecture of the polytene chromosomes. I have prepared an educational assessment report on "Drosophila polytene chromosomes as a model system for teaching essential concepts of the molecular biology dogma and chromatin in an undergraduate cell biology course".

I teach the **upper division level Biochemistry lecture & laboratory courses** for biology majors in such a manner as to **integrate genetics with biochemistry**. Students learn first-hand the biochemical basis and approaches that are undertaken to explain genetic processes that they had encountered earlier in the genetics course.

I have also had the experience of developing and teaching a **general education Human Biology course with emphasis on biotechnology for non-majors**. Non-majors, who have had no prior experience with biology, informed me that they enjoyed the first-hand biotechnology lab experience and learning of the potential benefits of recombinant DNA technology to society.

Grants, Program & Curriculum Development Experience at the University of Guam (UOG)

At the University of Guam, I have made an all out effort in all major aspects of university academic activities, namely course & curriculum development; establishing and improving science laboratory facilities for students; teaching based on research methods & design; educational equipment grant; research grant & research; interdisciplinary approaches to strengthening instruction & research in the Division of Natural Sciences; and university & community service.

With the support of a **National Science Foundation, CCLI educational grant** (Award No. DUE- 0089128), I established the first recombinant DNA technology based molecular cell biology & biochemistry teaching laboratory for biology students. I went on to develop and teach upper division level lecture & lab courses in, **Molecular Biology with a focus on Molecular Medicine**; **Biochemistry**; and **Cellular Physiology**. Introduction of a molecular lab helped the further development of the Genetics and Microbiology courses taught by other faculty. I introduced molecular genetic analysis techniques in the Introductory Microbiology course for pre-nursing and pre-pharmacy majors. These activities have led to a modern biology program for undergraduates at UOG. Pacific Island students of Guam and Micronesia have the opportunity of experiencing first-hand molecular cell biology and biochemistry lab work, thereby motivating them in pursuing careers in biology and the health profession. Several of our undergraduates have gone on to pursue careers in biomedical research and gained admission to medical and post-graduate nursing schools.

I received a **NIH MBRS SCORE Biomedical research award** which enabled me to pursue my research interests in transcriptional deregulation characteristic of cancer cells with undergraduate participation. Establishment of this lab provided the much needed molecular instrumentation and reagents for the molecular lab classes that I teach at UOG and greatly enhanced the academic atmosphere of the Division of Natural Sciences.

I have engaged in strengthening academic activities at the Division of Natural Sciences and **initiated the participation of Natural Sciences faculty in the NIH MBRS SCORE & RISE programs.** I have had the privilege of providing practical training on current technological developments in molecular genetic analysis of interest to fellow biology faculty members. I have mentored Biology adjunct teachers and staff technicians, on teaching methods and highlighting molecular aspects in teaching undergraduate biology courses. I have also undertaken interdisciplinary approaches to teaching by hosting workshops and lectures by faculty from the US mainland universities as well as UOG faculty. In turn, as guest lecturer, I have participated in the Evolution course for graduate students and the Current Topics in Cell Biology course at the Marine Lab for graduate students.

I have served as the **Chair, Division of Natural Sciences** for a period of five years and as **member of the College Academic Affairs Committee.** I have also been a member of the College of Arts & Sciences Curriculum Committee. I actively participate in University committee work and other services whenever called upon to do so, and have contributed to assessment & accreditation activities for the College of Natural & Applied Sciences.

I have been conducting on Guam, **"Annual Biotechnology workshop for high school students"**, and have visited schools and mentored high school students, in order to motivate pacific island students in careers in research. I have had the privilege of giving keynote speeches at science fairs for two prominent high schools on Guam. For the 60th Anniversary celebrations at the University of Guam, I initiated an open house event for the College of Natural & Applied Sciences for high school students. Reaching out to the high school students of Guam has become an integral part of the Natural Sciences Program.

Research Background and Accomplishments

Research on the viral trans-activators HIV-1 Tat and herpes simplex viral protein VP16, and the impact of my research in the field of eukaryotic transcription elongation:

I obtained my Ph.D. in Molecular Biology & Biochemistry from the University of California at Irvine - my research focus was on the mechanism of Dosage Compensation in Drosophila. I subsequently joined as post-doctoral fellow, the Howard Hughes Medical Institute at the University of California at San Francisco and where I investigated the unique mechanism of transcriptional activation by the HIV-1 Tat RNA-binding protein and control of transcription elongation. Taking clues from HIV-1 Tat, I also turned my attention to the well studied herpes simplex viral trans-activator protein VP16, and my studies led to a model where VP16 also played a dual role in elongation in addition to its well characterized role in transcription initiation. This work which I initiated at UCSF was continued independently as a research scientist at the Institute of Biotechnology at UTHSC San Antonio, Texas.

At UCSF, I developed novel transcription synergism *in vivo* assays to provide evidence that Tat indeed played a role in transcription elongation with no major effects on transcription initiation. My research and publication on Tat concentrated on mechanistic studies to highlight Tat as an unique RNA-binding *trans*-activator that regulates transcription by acting at the elongation stage downstream of the transcription start site, unlike typical activators that act upstream of the promoter via DNA interactions to stimulate initiation (*Ghosh et al. 1994; J. of Molecular Biology*). My paper was cited in the Introduction section of the breakthrough paper on Tat *trans*-activation mechanism by the laboratory of Dr. K. Jones at the Salk Institute in the journal *Cell, 1998, Vol 92, 451-62.* In 2004, my research work was included in a review paper on Tat in the European Journal of Clinical Investigation, Vol 34, 57-66.

With regards to my research on the trans-activator protein, VP16, I was among the very first few researchers to suggest a role for VP16 in elongation. I suggested a model where VP16 played a dual role both in stimulating rates of transcription initiation and elongation, thereby explaining the potent activation characteristic of this viral *trans*-activator protein (*Cold Spring Harbor Symposium on Cancer, 1995; Ghosh et al., 1996, J. of Biological Chemistry*). My *J. Biol. Chem.* publication was the second paper on role of VP16 in elongation and the first paper providing evidence that the elongation function resides in the 37 amino acid N terminal region of the acidic activation domain of VP16. I was awarded the "Texas Triangle Award for Outstanding Accomplishments" at the 1995 Texas Triangle Meeting in Molecular Medicine. My model has been quoted in the Discussion section of a paper entitled " The VP16 paradox---" by the laboratory of Walter Schaffner at the Basel Institute, in *J. of Virology, 1997, Vol. 71, 5952-62*; and, in the Introduction section of a paper published on the mechanism of VP16 *trans*-activation, by the laboratory of Michael Meisterernst of the Department of Gene Expression of the Institute of Molecular Immunology, Munich, in the journal *Genes to Cells, 2002, Vol 7, 49-58.*

At the Institute of Biotechnology, Texas, I was also involved with cloning & analysis of the human YY1 transcriptional activator/repressor protein encoding gene (*Nuc. Acids Res., Vol. 15,1998, pp 3776-3783.* My efforts with this project enabled a graduate student to complete her Ph.D. dissertation successfully. I then moved back to San Francisco at the Geraldine Brush Cancer Research Institute where I was a research scientist developing gene therapy vectors for targeting genes, using cationic liposomes, to specific tissues in mice models for human melanoma.

Subsequently, I joined the University of Guam (UOG) as a teaching faculty in the Division of Natural Sciences. At UOG my main focus has been on conducting research based projects for undergraduate students as part of the lab course in Molecular Biology. I have performed sabbatical research in the late Dr. Ben Yen's Lab at UCSF on the role of the LS protein of Hepatitis B virus in the induction of Hepatocellular Carcinoma. In annual academic year 2014-15, I engaged in sabbatical research at Emory University using the powerful Drosophila genetic system in investigating novel components of tumor suppressor and tumor promoting pathways that drive neoplasia and in novel screens for discovering potential therapeutic drugs.

Scholarly/Research Work at the University of Guam with undergraduate student participation (Teaching Faculty)

- **Ghosh, S. & Moberg. K. 2014-15**. Sabbatical research on "Mechanism of action of Yorkie oncoprotein in Drosophila". ***Emory University.***
- **Ghosh, S. & Chougule, M. 2013.** U54 ***UOG-UH*** Pilot Research Grant proposal on Cancer Biology submitted – favorable reviews obtained – funding pending.
- **Ghosh, S. 2013.** Directed student research projects on human BAP1 Tumor Suppressor protein and the human Spastin protein in nerve axonal regeneration – research presented at ***University of Guam*** CLASS Conference.
- **Ghosh, S. 2012.** Drosophila Polytene Chromosomes: A Model System for Molecular Cell Biology Concept and Research-based Learning for the Undergraduate Student. ***University of Guam.***
- **Ghosh, S. 2011.** Undergraduate Mini-Symposium on Molecular Biology; emphasis on using Bioinformatics Tools.
- **Ghosh, S. 2010.** Role of the LS Protein of Hepatitis B Virus in the induction of Hepatocellular Carcinoma (HCC). Abstract presented at ***First World Congress of Virus & Infections, Busan, S.Korea***, July 31-Aug 3.
- **Ghosh, S. 2010.** Report of an investigative project I conducted for an introductory microbiology class, detailing the strategy and assessment methods that I have taken to initiate and motivate the students to perform a microbiology project. ***University of Guam***.
- **CLASS Conference, *University of Guam*, Spring 2001, 2003, 2005, 2007, & 2009.** Presented along with students, a total of **10 posters** based on laboratory experiments conducted using research approaches for an upper division Molecular Biology course.
- **Ghosh, S. 2008.** Cloning Project: Human Genomic DNA library construction; A project activity for the upper division BI416L Cellular Physiology Lab class. ***University of Guam.***
- **Ghosh, S. 2005.** Reverse Transcriptase-Polymerase Chain Reaction studies on human Glucocorticoid Receptor expression in tumor tissues & correlation with expression of known oncogenes", ***NIH MBRS SCORE Biomedical Research Activity Report University of Guam.***
- **Ghosh, S. 2004.** Superactivation of gene transcription by herpes simplex virus VP16 *trans*-activator protein in response to extracellular stimuli is mediated at the post-initiation (elongation) stage of transcription. ***NIH MBRS SCORE Biomedical Research Report, University of Guam.***
- **Ghosh, S. 2003.** Biotechnology Laboratory Experience for Non-majors. A ***Laboratory Manual*** for a General Education Human Biology Course, ***University of Guam***.
- **Ghosh, S. 2000.** Isolation of Regulatory Transcription Elongation Factors in Humans. ***National Institutes of Health (NIH)*** MBRS SCORE Research Grant Proposal. ***Grant Awarded in 2001.***
- **Ghosh, S. 2000.** Molecular Biology Course Based on Study of Transcriptional Control. ***National Science Foundation (NSF)*** Course Curriculum & Laboratory Improvement (CCLI) Educational Grant Proposal. ***Grant Awarded in 2001.***

Research Publications

- Yao, Y., Dupont, B., **Ghosh, S.**, Fang, Y., Leach, R., and Seto, E. 1998. Cloning, chromosomal localization, and promoter analysis of the human transcription factor YY1. ***Nuc. Acids Res.,*** *Vol. 15, pp 3776-3783.*
- **Ghosh, S.**, Toth, C., Peterlin, B. M., and Seto, E. 1996. Synergistic activation of transcription by mutant and wild-type minimal transcriptional activation domain of VP16. ***Journal of Biological Chemistry***, *Vol. 271, pp 9911-9918.*
- **Ghosh, S.**, Selby, M.J., and Peterlin, B.M. 1993. Synergism between Tat and VP16 in *trans*-activation of the HIV-1 LTR. ***Journal of Molecular Biology***, *Vol. 234, pp 610-619.*
- Peterlin, B.M., Adams, M., Alonso, A., Baur, A., **Ghosh, S.**, Lu, X., and Luo, Y. 1993. Tat *trans*-activator, ***Human Retroviruses*** edited by Bryan R. Cullen, ***Oxford University Press***.
- **Ghosh, S.,** Lucchesi, J.C., and Manning, J.E. 1992. The non-dosage compensated LSP1-ˉ gene of *Drosophila melanogaster* lies immediately downstream of the dosage compensated LI2 gene. ***Molecular and General Genetics***, *Vol. 233, pp 49-52.*

- **Ghosh, S.,** Chatterjee, R.N., Bunick, D., Manning, J.E., and Lucchesi, J.C. 1989. The LSP1-□ gene of *Drosophila melanogaster* exhibits dosage compensation when it is relocated to a different site on the X-chromosome. ***The EMBO Journal,,*** *Vol 8,#4, pp1191-1196.*
- **Ghosh, S.** 1990. Identification of a *Drosophila melanogaster* X-linked gene, LI2 expressed in the second larval instar stage of development and isolation and characterization of it's cDNA. ***Ph.D.Thesis***
  University of California at Irvine.

Talks/Posters/Conferences

- **First World Congress of Virus & Infections, Busan, S.Korea, 2010.** Presented **research abstract** "Role of the LS Protein of Hepatitis B Virus in the induction of Hepatocellular Carcinoma (HCC)".
- **Tohoku University Graduate School of Medicine, Japan, 2003.** Presented **research talk** on "Effects of extracellular stimuli on transcriptional elongation".
- **Kyoto University Hospital, Molecular Oncology Division, Japan, 2002.** Presented **research talk** on "Stimulation of transcription elongation by transcriptional activators and implications for cancer biology".
- **University of Guam MBRS Seminar Series, 2002 & 2005.** Presented **research talk** entitled "Modulation of Gene Transcription by Viral & Cellular Regulatory Molecules'.
- **University of Guam Marine Lab Seminar, 1999.** Presented **research talk** on "Transcription Elongation Control".
- **India, 1999.** Presented **research talk** entitled "Control of Transcription Elongation: applications for cancer & viral biology" at :**(i)** Tata Memorial Cancer Research Institute, Bombay; **(ii)** Tata Institute of Fundamental Research, Bombay; **(iii)** Indian Institute of Science, Bangalore; and **(iv)** National Centre for Biological Sciences, Bangalore.
- **Japan Schering Basic Research Institute Seminar, Japan, 1998.** Presented **research talk** entitled "Transcription elongation: an important stage in regulating eukaryotic gene expression".
- **California Pacific Medical Center Research Institute Seminar Series, 1998.** Presented **research talk** entitled "Transcription elongation and the regulation of gene expression".
- **Cold Spring Harbor Meeting on Cancer Cells, New York, 1995.** Presented **research poster** entitled "Activation features of VP16 when tethered to RNA-implications for role in transcription elongation".
- **Texas Triangle Meeting in Molecular Medicine, Texas, 1995.** Presented **research talk** on "Activation features of VP16 when tethered to RNA-implications for role in transcription elongation".
- **Lost Pines Molecular Biology Conference, Texas, 1994.** Presented **research talk** on "Role of herpes simplex virus VP16 *trans*-activator protein in transcription elongation".
- **Keystone Meeting on Transcription Elongation and Termination, Colorado, 1991.** Co-author in **research abstract** entitled "HIV-1 Tat *trans*-activator".
- **Southern California Drosophila Research Conference, California, 1990.** Presented **research talk** on "Recent studies on the phenomenon of dosage compensation in Drosophila".
- **Stanford University, 1990.** Presented **research talk** to a research lab on "Recent studies on the phenomenon of dosage compensation in Drosophila".
- **Washington University School of Medicine, 1990.** Presented **research talk** to a research lab on "Recent studies on the phenomenon of dosage compensation in Drosophila".

Mentorship & Community Service

- "Annual Biotechnology Workshop for High School Students of Guam", 2003 - 2013.
- Keynote Speaker, St. Thomas Aquinas High School Science Fair 2012, Guam.
- Keynote Speaker, St. Johns High School Science Fair 2008, Guam.
- Mentored High School Students of Guam for their Science Fair Projects.
- Invited Speaker, Career Day, George Washington High School of Guam, 2004.
- Served as Judge for the Island-wide School Sciences Fair held at the UOG, 2000.
- Provided mentorship and recommendation letters to UOG Biology majors for Medical, Nursing, & Veterinary Schools, and research programs.
- Provided training in molecular/cell biology experiments for lab courses at UOG, to staff lab technicians.

University Service

- Chair, Division of Natural & Applied Sciences, University of Guam; 2009 - 2014.
- Member & Vice-Chair, Academic Affairs Committee, College of Natural & Applied Sciences, 2009 - 2014.
- UOG 60th Anniversary, Co-Chair, Planning Committee for College Open House 2012.
- Lecture presentation representing Natural Sciences at CNAS Retreat, 2010.
- Member, Faculty Development Day Planning Committee, 2011
- Molecular Biology Lab class posters presented at the Spring 2009 display for WASC accreditation.
- Member, Course and Curriculum Committee, College of Arts & Sciences, 2001-2004.
- Chair, Math Faculty Reappointment Committee, 2008
- Member, Math Faculty Search Committee, 2008; Biology Faculty Search Committee, 2008, 2010, & 2012.
- Member, College Sub-committee on student recruitment and retention, 2010.
- Member, Thesis Committee for Masters Student, 2010.
- Initiated participation of Biology and Chemistry undergraduate faculty in the MBRS SCORE & RISE Programs at the University of Guam.
- Provided training in Molecular Genetic Analysis techniques to a Biology faculty at UOG.
- Guest Speaker in courses taught by two fellow Biology colleagues at UOG.
- NSF Educational Grant Management & Bookkeeping: Modernization of Undergraduate Biology Program.
- CNAS Pinning Ceremony, 2005, 2009, 2010, 2013.
- Biology Program Review, 2005 & 2010.
- Participated in UOG "Got Major" Fair, 2010.
- Represented Natural Sciences at UOG Assessment Workshop, 2010.
- Represented Natural Sciences at UOG Retention Committee 2010.
- Represented Natural Sciences at UOG GradeBook Workshop, 2010.
- Consultant, UOG Policy on blood borne pathogens.
- Initiated participation of Biology and Chemistry undergraduate faculty in the MBRS SCORE & RISE Programs at UOG.
- Provided training in Molecular Genetic Analysis techniques to a Biology faculty at UOG.
- Guest Speaker in courses taught by two fellow Biology colleagues at UOG.
- Nominated Ms. Julie Pangelinan, Administrative Assistant, Natural Sciences for UOG Employee of the Year Award. Ms. Julie won the award in 2010.

Curriculum Vitae

Mohammed H. GOLABI

ADDRESSES:

Mailing Address:
P.O.Box 5395
UOG Station
Mangilao
Guam-USA 96923

Work Address:
College of Natural and Applied Sciences
University of Guam
Mangilao, Guam 96923
Tel.: (671) 735-2134 Fax: (671) 734-4600
email: mgolabi@uguam.uog.edu

EDUCATION:

Ph.D., 1991. Applied Soil Physics. Department of Crop and Soil Sciences, College of Agriculture and Environmental Science, University of Georgia. Athens, Georgia, USA

Ph.D. Dissertation: SOIL PHYSICAL PROPERTIES AND THEIR INFLUENCE ON INFILTRATION AND WATER AND SOLUTE MOVEMENT UNDER NO-TILLAGE MANAGEMENT SYSTEMS.

Dissertation Abstract Number: DA9133481. *In*: The Dissertation Abstract International. Vol. 52, No. 6
Dec. 1991. P 2827-B

This Dissertation has been cited in professional journals by authors.

MS, 1986. Agricultural Extension Education. University of Georgia, College of Agriculture
BS, 1982. Engineering and Mechanized Agriculture. Oklahoma State University, Ag. Eng. Dept.

PROFESSIONAL EXPERIENCE:

July 2014 – Present: Professor - College of Natural and Applied Sciences, University of Guam, Guam-USA

Duties and Responsibilities

Teaching: - Soil and Environmental Science Courses: Undergraduate and Graduate

Research:
- Integrated Ecosystem Approach for soil and water conservation.
- Watershed management techniques by using Vetiver System (VS) for controlling sedimentation for water quality improvement and natural resources restoration.
- Waste management and Composting as a Resource Recovery Strategy for soil quality improvement and for agricultural sustainability and environmental integrity.
- Biomass production of Vetiver grass for use in biofuel.
- Development of new and innovative techniques of using Vetiver Grass Technology (VGT) for urban swage and waste water treatment - as an alternative to current energy requiring mechanical methods.
- Carbon Sequestration, agricultural sustainability and their impact on climate change.
- Studying the impact of Biochar on soil quality improvement and its effect on soil carbon dynamics

Extension: - Extension projects conducting applied research to address the tropical farming techniques as well as natural resources preservation while maintaining the

environmental quality of natural resources.
- Educational outreach as relates to soil and water conservation.
- Educational outreach as relates to use of Vetiver Grass System for watershed management and for reducing sedimentation and for water quality improvement downstream and in the ocean.
- Educational outreach as relates to composting and the application of compost as soil amendment and as a Resource Recover Strategy for agricultural sustainability and for maintain the environmental integrity of the island.

University Services:
- Provide University wide services by serving in committees and faculty senate.
- Provide advisement services to undergraduate students and also serve in the graduate student advisory committees.
- Currently serving as the Chair of the Environmental Science Graduate program and serve in the University wide graduate advisory council.

May 2005 – July 2014: Associate Professor- College of Natural and Applied Sciences, University of Guam, Guam-USA

2001- 2005: Assistant Professor- College of Natural and Applied Sciences, University of Guam, Guam-USA

1995 – 2001: Post Doctorate and Research Associates: University of Georgia (UGA) and USDA-ARS, at the JP Center in Watkinsville, Georgia.

1991– 1995: Post-Doctoral Research Assoc., Agronomy Dept., Purdue University.

RESEARCH INTERESTS:

- Development of techniques and methodology for characterizing the hydraulic properties of the soil affected by different farming practices. The effects of surface crop residues and subsurface macroporosity on water infiltration into the soil profile. Effect of crop residue on soil quality for agricultural sustainability.

- Watershed management and use of Vetiver Grass System for trapping sediment and controlling soil erosion on slopping lands.

- Developing management techniques to slow and/or retard preferential macropore flow as a preventive technique for reducing the risk of groundwater contamination under no-tillage production system.

- Developments of techniques to evaluate the effects of no-tillage management as well as the effect of inter cropping on chemical, physical and biological properties of the soil.

- Development of organic waste conversion to organic fertilizer (Composting) as a 'Resource Recovery Management strategy' and as an alternative to conventional waste management techniques (landfill) for protecting the integrity of the environmental.

- Bio-remediation of Contaminated Soils by using organic material as a way of enhancing the biological activities in the contaminated soils and for mitigating the environmental pollution caused by soil and water contamination.

- Use of Vetiver Grass Technology (VGT) for the purification and treatment of urban sewage water for water quality improvement.

- Studying the effect of Biochar on soil carbon dynamics and soil carbon content and impact of Carbon Sequestration as an important factor related the climate change.

RESEARCH PROJECTS:

Funded Research Grants/Projects:

1. **2014 – Present.** Developing a Waste management strategy for Guam household and hotel/restaurant industry. Joined project managed by CIS, part of the 'Eco Feed Program. Funded ($377,956) by the Office of Insular Affair's Technical Assistance Program. **Co-PI:** M. H. Golabi.

2. ***2012-2014***. Talakhaya (Rota) Watershed Soil Loss Assessment. **PI:** M. H. Golabi (UOG). **Co-PI:** Dana Danko (Saipan Coastal Management). Funded ($97,200 for 1st year, additional $34,200grant is expected for 2nd year).

3. ***2005-present***. Large Scale Composting of Organic Wastes for agricultural sustainability and environmental quality. Fund awarded $68,000 (local fund). **PI:** M.H. Golabi. Ongoing project.

4. ***2010-present.*** Evaluating Soil Organic Carbon (SOC) Storage Capacity under different conservation tillage practices on the degraded lands of southern Guam. **PI:** M.H. Golabi. Multi State Project (10,000/year). Ongoing project

5. ***2010-2013***. Evaluating Environmental Impact of Land Application of Composted Organic Waste on Calcareous Soils in the Tropical Island of Guam. **PI**: M.H. Golabi (UOG). **Co-PIs:** Endale Dinku (NRCS – Georgia), Sayed Hassan (UGA), Bob Schlub UOG). T-STAR project ($146,135). Ongoing project

6. ***2011-2012***. Towards Understanding Soil Carbon Sequestration (conference): Processes and Mechanisms on Eroded Landscapes'. **PI**: M.H. Golabi. USAD-NIFA ($4,000).

7. ***2011-2013***. Crop Residue Management for Biofuel Production and Soil Quality. **PI:** M H. Golabi (UOG). NC1178 Multi-state group project (10,000/year). Ongoing project

8. ***2009-2010.*** Understanding Household Waste Generation on Guam- Phase I- The Survey. A Cooperative research project between the University of Guam and Okayama University in Japan. **PI:** M H. Golabi (UOG). **CO-PIs:** Kirk Johnson (UOG), Takeshi Fujiwara (Okayama Univ), and Eri Ito (Okayama Univ). Collaborative Project ($10,000/year).

9. ***2007-2009***. Characterizing Nitrogen Mineralization and Plant N Supply from Animal Manures in Hawaii's and Guam's Agricultural Soils: Guam Field Trials. **P.I:** M.H.

Golabi. USDA-NRCS and University of Hawaii Collaborative Research. One year (subject to extension to two years). **$48,820/year**

10. ***2005-2010.*** Soil Management practices for Agricultural Sustainability and Environmental Quality in the island of Guam. Hatch project ($10,000/yearly). **PI:** M.H. Golabi. Long-Term ongoing study.

11. ***2003-2006.*** Composting of disposed organic wastes for forest and agricultural land use as soil ameliorant. REERA funded ($10,000/yr for year 2002, $12,500 for year 2003). **PI**: M.H. Golabi

12. ***2001-2004.*** Soil management for enhancement of productivity and environmental quality for southern Guam. SREES funded Hatch Project ($20,000/yr for 3 years: 2001-2004). **PI**: M.H. Golabi

13. ***2004-2007.*** An Ecosystem approach for restoring and conserving soil quality in degraded lands of the Pacific islands (Hawaii and Gaum). **PIs:** M.H. Golabi (UOG) and S. El-Swaify (UH). (T-STAR award: **$169,000**).

14. ***2003-2005.*** Sediment and Erosion Mediation in the Pacific National Historic Park Watershed Basin Project. Subcontracted from Pacific National Park Watershed Basin. Funded by the US Forest Services. Amount awarded: $58,000 total (2003 – 2005). **PI**: M.H. Golabi, **Co-PI:** Dr. D. Minton. The objective of this project was to develop soil erosion control techniques and assess sediment loading from a typical watershed in southern Guam. This project site however is maintained for Demonstrations and Educational purposes.

15. ***2003-2004.*** The effect of composted organic material on eroded soils for the enhancement of soil organic matter and general soil quality improvement. A Renewable Resources Project: $12,500 per year (2003-2004). **PI:** M.H. Golabi.

16. ***2002-2004.*** Impact of Ordot Dump on Water Quality of Lonfit River Basin in Central Guam. USGS funded ($39,000/yr) **PIs**: M.H. Golabi (CNAS) and G. Denton (WERI)

17. ***2001-2002.*** Nutrient recycling of animal effluent - A water quality initiative. EPA-NRCS: contracted monitoring project. **$20,000**.

18. ***2001-2002.*** Effect of Garlic plant as Companion on Tomato performance -an Allopathic approach for Pest Control. Part of the HATCH project for 2001-2002 FY. **PI:** M.H. Golabi. This project was initiated as a trial experiment; however the project was halted due to the typhoon devastation.

PUBLICATIONS:

Journal Articles

1. **Golabi M. H**. Kirk Johnson. Takeshi Fujiwara and Eri Ito (2014) Transforming Municipal Waste into a Valuable Soil Conditioner through Knowledge-Based Resource-Recovery Management. Int J Waste Resources 4:140. doi: 10.4303/2252-5211.1000140

2. **Golabi, M. H**., S.A. El-Swaify, and Clany Iyekar (2014). Experiment of "no-tillage" farming system on the volcanic soils of Tropical Island of Micronesia. International Soil and Water Conservation Research Journal. Vol. 2. No. 2. June 2014.

3. Dixon Boyd. Samuel Walker. **M. H. Golabi**. and. Harley Manner. 2012. Two probable latte period agricultural sites in northern Guam: Their Plants, Soils, and interpretations. Micronesica-A Journal of the University of Guam. Volume 42(1/2). March 2012.

4. Mirdamadian S.H. Emtiazi G. **M.H. Golabi**. Ghanavati H. 2010. Biodegradation of Petroleum and Aromatic Hydrocarbons by Bacteria Isolated from Petroleum-Contaminated Soil. J Pet Environ Biotechnol 1:102. doi:10.4172/2157-7463.1000102

5. Xirui Zhang. Hongwen. Li. Jin He. Qingie Wang. and **M. H. Golabi**. 2009. Influence of conservation tillage practices on soil properties and crop yields for maize and wheat cultivation in Beijing. China. Australian Journal of Soil Research. SCIRO publication: 47. 362-371. http://www.publish.csiro.au/journals/ajsr

6. **Golabi, M.H**., G. R.W. Denton. H. R. Wood. Yuming Wen. and Clancy. Iyekar. 2008. Impact of Ordot Dump on Water Quality of Lonfit River Basin in Central Guam II. Micronesica 40(1/2). July 2008.

7. **Golabi, M.H**. P. Denny. C. Iyekar. 2007. Value of composted organic wastes as an alternative to synthetic fertilizers for soil quality improvement and increased yield. Compost Science and Utilization. Vol 14. No. 4. Pp 267-271

8. **Golabi, M.H**., G. R.W. Denton. H. R. Wood. Yuming Wen. and Clancy. Iyekar. 2006. Impact of Ordot Dump on Water Quality of Lonfit River Basin in Central Guam I: Soil Characterization of Nutrient Retention. Micronesica 39 (1): 41-54. 2006.

9. **Golabi, M.H**. P. Denny. C. Iyekar. 2006. Composting of Disposal Organic Wastes: Resource Recovery for Agricultural Sustainability. The Chinese Journal of Process Engineering. publication of Chinese Academy of Sciences. Vol.6.. No. 4. August 2006.

10. **Golabi, M.H**., C. Iyekar. and M.J. Denney. 2005. Challenges and Actions regarding the Rehabilitation of Degraded lands - Case study in southern of Guam. *In:* The proceedings of International Symposium on Land Degradation and Desertification. Sponsored by the Commission on Land Degradation and Desertification (COMLAN/UGI) and published by Revista Sociedade & Natureza. Institute de Geografia UFU. Uberlandia – Minas Gerais. Brazil. May 2005. Special Issue – May 2005. ISSN 0103-1570.

11. **Golabi, M.H**., Dwayne Minton, C. Iyekar, C.L. Raulerson, and J. Chargualaf Drake. 2005. Watershed Management to Meet Water Quality Standards by Using the Vetiver System in Southern Guam. Australian Journal of Technology. 9 (1): 63-69 (July 2005).

Book Chapters:

1. **Golabi, M.H.** Soils. *In*: Danko Taborosi (ed.). 2013. 'Environment of Guam'- Island Environments Series. Island Research and Education Institute. www.islandresearch.org

2. **Golabi, M.H**., Kirk. Johnson. Takeshi Fujiwara, and Eri Ito. 2012. Transforming the Island's Municipal Waste into a Valuable Soil Conditioner via Knowledge based Resource Recovery Management System. Published *In*: Human Migration and the 21st Century Global Society Project. Publication of the University of the Ryukyus, Okinawa, Japan. ***In Japanese***

3. **Golabi, M.H**., 2012. Using Vetiver Technology (VGT) for the Management of Water Runoff from Construction site in southern Guam. *In*: Human Migration and the 21st Century Global Society Project (Japanese). Publication of the University of Ryukyus, Okinawa, Japan.

4. **Golabi, M.H**., Dwayne Minton, Clancy Iyekar, C.L. Raulerson, and J. Chargualaf Drake. 2011. Using Vetiver System as an Effective Watershed Management Strategy to control Soil Erosion and prevent Sediment Loading downstream for improving Water Quality and protecting the Coral Reef in southern Guam. *In*: Human Migration and the 21st Century Global Society Project. Publication of the University of Ryukyus, Okinawa, Japan.

5. Savabi, M.R., **M.H., Golabi**, A.A., Abou-Arab, and E.J., Kladivko. 2008. Infiltration Characteristics of No-Till vs. Conventional Tillage in Indiana and Illinois Farm Fields. *In:* Goddard T., M. A. Zoebisch, Y. Ellis, A. Watson, and S. Sombatpanit (editors). 'No-Till Farming Systems', A publication of the World Association of Soil and Water Conservation. (Special Publ., No. 3).

6. **Golabi, M.H.**, C. Iyekar, M. J. Denney and D. Minton. 2006. Ecosystem Approach to Soil and Water Conservation for Sustainable Land Management Systems: Case Studies from Severely Eroded Soils of southern Guam. *In:* UNESCO Ecological Book Series on Land Resource Management and Ecological Restoration. UNESCO, China

7. **Golabi, M.H**. 2002. Environmental Impact of Soil Erosion and Land Degradation in Moghan (Northern) and Behbahaan (Southern) Regions of Iran: Report from TOKTEN-UNDP Mission to Iran. *In*: 'Sustainable Utilization of Global Soil and Water Resources'. Selected Papers from the 12th International Soil Conservation Organization Conference. Tsinghua University Press (pp 379-383). May 26-31, 2002. Beijing, China.

International Bulletins:

1. Golabi, Mohammad H., and Manuel Duguies. 2013. Application of the Vetiver System for Wastewater Treatment: An Innovative Nutrient Removal Technology for Sewage Water treatment in southern Guam. Technical Bulletin No. 2013/1. Publication of the: Pacific Rim Vetiver Network. Office of the Royal Development Projects Board. Bangkok, ***Thailand***. April 2013.

Abstracts:

(More than *65 abstracts were submitted and mostly were reviewed and accepted for presentation at the national and international conferences. some of the abstracts are included in the package folders. Please see the binder '$\mathbf{I_{G6}}$' under '**Abstracts**').*

Proceedings/Abstract Books/Annual Reports:

1. **Golabi, M. H**., Kirk Johnson. 2013. Innovative Zero Waste Technology for Sustainable Solid Waste Management. *In*: Proceedings of the International Conference on Solid Waste-Innovation in Technology and Management. May 5-9, 2013. Hong Kong SAR, P.R. ***China***.

2. **Golabi, M. H**., Kirk Johnson, Takeshi Fujiwara, and Eri Ito. 2011. 'Waste Generation in the island of Guam-A cooperative research project with UOG and the Okayama University in Japan-'Phase I': The Survey'. *In: The Annual Reports* – 'Practical Research and Education of Solid Waste Management Based on Partnership among Universities and Governments in Asia and Pacific Countries'. March 3, 2012. Okayama, ***Japan***.

3. **Golabi, M.H**., Samir A. El-Swaify. 2012. Effect of long-term conservation practices on soil carbón dynamics and soil quality for agricultural sustainability and natural resources preservation in the Micronesian island of Guam. In: Special publication (No. 7) by: The world Association of Soil and Water Conservation (WASWAC). www.waswac.org

4. **Golabi, M.H**., and M. Duguies. 2010. Using Vetiver Grass System (VGS) for Local Wastewater Treatment. *In*: Proceedings of the 2nd CNAS Conference. January 13, 2010. University of Guam.

5. **Golabi, M.H**., Manuel Duguies, Julie Shane, Leanne Obra, Gregorio Perez, Grace Ibanez, and Edwin Paulino. 2009. Vetiver gras System for Inarajan Municipal Waste water Treatment. *In*: Proceedings of the National Water Conference. St. Louis, Missouri. Feb. 2009.

6. **Golabi, M.H**., G.R.W. Denton, H.R. Wood, Y.Wen, and C. Iyekar. 2006. Soil Properties and its Impact on the Mobility of Contaminants Leached Down Gradient of Ordot Landfill in Central Guam. *In:* Proceeding of the 2006 Annual International Conferences of the American Soeiety of Agriculture and Biological Engineering (ASABE) in Portland, Oregon, USA. July 2006

7. **Golabi M.H**., S.A. El-Swaify, C. Iyekar, and Edward Paulino. 2006. An Ecosystem approach to restoring and conserving soil and water in degraded lands of the Pacific island of Guam. *In*: The Proceedings of the 14th International Soil Conservation

Organization (ISCO) Conference: Water Management and Soil Conservation in Semi-Arid Environment. Marrakech, Morocco, May 14-19, 2006. (***The paper was submitted but did not attend the conference***).

8. **Golabi, M.H**. 2006. N-Mineralization via animal application as soil nutrient supply. *In*: programs of the College of Natural and Applied Sciences Research Conference. Hilton Hotel. Tumon. October 23, 2006.

9. **Golabi, M. H**., Dwayne Minton, and C. Iyekar. 2006. Using Vetiver Technology to reduce watershed sedimentation for water quality improvement downstream in southern Guam. *In:* Presented of the: 4th International Conference on Vetiver (ICV-4). Caracas, Venezuela. October 22-26, 2006.

10. **Golabi, M.H**. C. Iyekar, and D. Minton. Effect of Vetiver Technology on Sediment Loss and Water Quality in Southern Guam. *In:* Proceedings of the 3rd Watershed Management to Meet Water Quality standards and emerging TMDL. Conference sponsored by ASAE. March 2005. Atlanta, Georgia

11. **Golabi, M. H**., Thomas E. Marler, Erica Smith, Frank Cruz, J.H. Lawrence. 2003. Sustainable Soil Management Techniques for Crop Productivity and Environmental Quality for Guam. *In:* Proceedings of the International Seminars on Farmer's Use of Diagnostic Systems for Plant Nutrient Management. Sponsored by the Food and Fertilizer Technology Center for the Asian and Pacific Regions (FFTC/ASPAC), and the Rural Development Administration (RDA) of the Republic of Korea. August 11 – 15, 2003. Suwon, south Korea

12. **Golabi, M. H.,** M.J. Denney, and C. Iyekar. 2003. Composting of disposal organic wastes for forest and agricultural land use as Resource Recovery Management. *In*: Proceedings of the 20th Pacific Science Congress, "Science and Technology for Healthy Environment". Bangkok, Thailand. March 17-21, 2003

13. **Golabi, M.H**., P. Denney, and C. Iyekar. 2005. Management Solution for Improving Soil Organic Matter for Crop Productivity and Environmental Quality in the Tropical island of Guam. *In*: Proceedings of International Symposium for Management of Tropical Sandy Soils for Sustainable Agriculture. Sponsored by IRD, IWMI, UNCCD, ISRIC and FAO. November 27 – December 2, 2005, Khon Kaen, Thailand.

14. **Golabi, M.H.**, C. Iyekar, and M.J. Denney. 2004. 'Soil and Water management for Agricultural Sustainability and Environmental Integrity - Case studies from degraded soils of northern Iran and severely Eroded Soils of southern Guam'. *In*: Proceedings of the 3rd International Conference on Land Resource Management and Ecological Restoration in Loess Plateau. Sponsored by the Chinese Ministry of Education and UNESCO. Published by the Northwest Sci-Tech University of Agriculture and Forestry. Yangling, China. September 2004.

15. **Golabi, M.H**., M.J. Denney, and C. Iyekar. 2004. Use of Green Manure and Composted

Organic Wastes as an Alternative to Synthetic Fertilizers for Enhancing Crop Productivity and Agricultural Sustainability on the Tropical island of Guam. *In*: Proceedings of the 13th International Soil Conservation Organization Conference - Conserving Soil and Water for Society: Sharing Solutions. Brisbane, Queens land, Australia. July, 2004. www.isco2004.org

16. **Golabi, M.H.**, C. Iyekar, G. Denton, R. Wood, and M. Ventura. 2003. Impact of Ordot Dump on Water quality of Lonfit River basin in Central Guam. *In*: Proceedings of the 20th Pacific Science Congress, "Science and Technology for Healthy Environment". Bangkok, Thailand. March 17-21. 2003

17. **Golabi, M.H**, Jenifer Coleson, Leah Juarros, and Clancy Iyekar. 2002. Composting: A Resource Recovery Concept and an Alternative to land filling. *In*: Proceeding of the 21st Annual Pacific Islands Environmental Conference. June 24-28, 2002. Koror, Palau.

18. **Golabi, M.H.**, E.J. Kladivko, R.E. Knighton. 1995. Real-Time In-Situ measurement of soil and solute fluxes with Time Domain Reflectometry (TDR) to estimate Solute Transport Parameters under field conditions. *In*: Proceedings of the International Symposium on Water Quality Modeling. Sponsored by ASAE. April 2-5, 1995, Orlando. Florida

19. Radcliffe, D.E., **M.H. Golabi**, W.L. Hargrove. 1991. Chemical leaching in large conventional and no-tillage soil columns. *In*: K.J. Hatcher (ed.) - Proceedings of the 1991 Georgia Water Resourees Conference, Athens, Georgia.

20. Ford P.F, W.L. Hargrove, **M.H. Golabi**. 1988. Sustaining soil productivity through use of legume cover crops and no-till management. *In*: Proceedings of the International Conference on Sustainable Agriculture. 1988, Columbus, Ohio.

Technical Reports:

1. **Golabi, M. H.**, Pavlina Fojtikova, Kawika Davis, and Robert Mendi (2014). Soil Carbon Sequestration. Brochure supported by the USDA/NIFA grant no. 61-1F-243018-R-5200510.

2. Manibusan Sydonia N. C., S. Khosrowpanah, M.A. Lander, and **M.H. Golabi**. 2102. The Hydrologic Response of the Piti-Asan Watershed to Development. A Publication of Water and Environmental Research Institute (WERI) of the College of Natural and Applied Sciences (CNAS) of the University of Guam. In Progress

3. Maria Kottermair, **M.H. Golabi**, Shahram Khosrowpanah, Yuming Wen. 2011. Spatio-Temporal dynamics of Badlands in southern Guam: A Case Study of selected sites. Publication of Water and Environmental Research Institute (WERI) and College of Natural and Applied Sciences (CNAS) of the University of Guam. Technical report No. 133, September 2011

4. Denton, G.R.W., H. R. Wood, Y. Wen, **M.H., Golabi**, Clancy Iyekar. 2005. Contaminant Scan of Leachate Streams from Ordot Landfill and Levels of Primary

Pollutants in Surface Waters and Soil Pore Waters Down gradient. Publication of Water and Environmental Research Institute (WERI) and College of Natural and Applied Sciences (CNAS) of the University of Guam. Technical Report No. 108, November 2005

5. Minton, Dwayne, **M. H. Golabi**, and C. Iyekar. 2005. Erosion Flumes. *In:* Fire, Erosion, and Sedimentation in the Asan – Piti Watershed and War in the Pacific NHP, Guam. Technical Report for the National Park Service. August 3, 2005

6. Rongo, Teina, R.H. Richmond, **M.H. Golabi**, P. Schupp, and L. Raymundo. Coral Community Change along a Gradient in Founa Bay, Guam. Marin Lab, UOG. Master Thesis submitted to the Marine lab for publication (technical Report). August 2005

7. Denton, G., and **M.H. Golabi**. 2002. Impact of Ordot Dump on Water Quality of Lonfit River Basin in Central Guam. *In*: Annual Report of The Water and Environmental Research Institute (WERI) of the western Pacific, University of Guam. October 2002

8. Scheman, Nicole D. , S Khosrowpanah, **M.H. Golabi**, and L. Heitz. 2002. Identification of Erosion Process and Sources of Exposed patches in Lasa Fua Watershed of Southern Guam. Submitted to the Water and Environmental Research Institute of the University of Guam. Technical report No 99. December 2002.

9. Teina Rongo, R.H. Richmond, **M.H. Golabi**, P. Schupp, and L. Raymundo. Coral Community Change along a Gradient in Founa Bay, Guam. Marin Lab, UOG. Master Thesis submitted to the Marine lab for publication (technical Report). August 2005

10. Nicole D. Scheman, S Khosrowpanah, **M.H. Golabi**, and L. Heitz. 2002. Identification of Erosion Process and Sources of Exposed patches in Lasa Fua Watershed of Southern Guam. Submitted to the Water and Environmental Research Institute of the University of Guam. Technical report No 99. December 2002.

11. Morris L.A., **M.H. Golabi**, W.P. Miller, M.E. Sumner. 1995. Mill Residues and Byproducts Utilization Project. Submitted to the Department of Forest Resources, University of Georgia and Participating pulp and Paper industry's management.

12. Morris L.A., **M.H. Golabi**, W.P. Miller, M.E. Sumner. 1996. Mill Residues and Byproducts Utilization Project. Submitted to the Department of Forestry Resources, University of Georgia and Participating pulp and Paper industry's management.

Local Newspaper Articles:

1. Golabi, Mohammad H. 2014. Technology is no substitute for learning. Pacific Daily News. Monday, November 23, 2014. Vol.46, No. 295

2. Golabi, Mohammad H., 2013. UOG workshop will highlight Soil Quality. Pacific Daily News. Thursday, January 3, 2013. Vol.44, No. 337. Hagatna, Guam.

3. Golabi, Mohammad H. 2012. Agricultural Graduate Degree Program needed. Pacific Daily News. Monday, November 12, 2012. Vol.44, No. 285

4. Golabi Mohammad H. 2012. Check out Erosion simulation model at UOG. Pacific Daily News. Tuesday, March 13, 2012. Vol. 44, No 41.

5. Golabi Mohammad H. 2011. Soil play important role in Climate Change. Pacific Daily News. Monday, August 1, 2001. Vol. 43, No. 181.

6. Golabi, M. 2011. A Sustainability Issue for Guam. Marianas Variety. Monday May 2, 2011. Vol. 06, No. 150

7. Golabi Mohammad H. 2011. We must Care for Soil, A Vital Resource. Guam Pacific Daily News. Thursday, December 29, 2011. Vol. 43, No. 331

8. Golabi, Mohammad H. 2010. Vetiver grass can ease drought effects. Pacific Daily News. Tuesday, June 15, 2010. Vol. 42, No. 134.

9. Golabi Mohammad H. 2010. Guam should explore Methane Gas option. Marianas Variety. Wednesday, October 6, 2010. Vol 06, No. 003

10. Golabi, Mohammad. 2008. Turn Guam's Trash into Energy Source. Pacific Daily News. Wednesday, January 30, 2008.

11. Golabi, Mohammad H. 2007. Protect, Preserve and Restore Natural Ecosystem. Marianas Variety. Friday April 20, 2007. Vol. 03, No 143

12. Golabi, Mohammad H. 2006. Vetiver grass can Hold Soil, Clean Water. Pacific Daily News. July 23, 2006. Vol. 38, No. 172.

13. Golabi, M. H. June 2005. Soil Erosion: A Threat to Guam's Ecosystem. Guam Pacific Daily News. 2005.

14. Coleson J, and M.H. Golabi. April 14, 2002. Composting Methods to be demonstrated. Guam Pacific Daily News. Sunday, April 14, 2002.

15. Golabi, M.H. September 30, 2001. Healthy Soils makes Healthy Crops. Guam Pacific Daily News. Sunday, September 30, 2002.

Articles Reviewed and Edited or Contributed to:

As a reviewer and a member of the editorial board for ISWCR journal I have reviewed several articles and journal manuscripts and continue receiving manuscripts for review by various national and international journals.

EXTENSION PUBLICATIONS:

1. **Golabi, M. H**., Francis Valencia, and Aletka Iyechad. 2012. Sedimentation Simulation for Education. College of Natural and Applied Sciences of the University of Guam. Poster Publication. July, 2012. ***Poster***

2. **Golabi, M.H**., and C. Iyekar and Edward Paulino. 2010. Agronomic value of composted organic wastes as alternative to synthetic fertilizers for Soil Quality improvement and increased yield for the tropical island of Guam. College of Natural and Applied Sciences, University of Guam, Mangilao, Guam-USA. ***Poster***

3. **Golabi, M. H**., Farouq Abawi, James C. Yu. 2006. Backyard Composting: Recycling Organic Waste for Home Gardening. **Extension Bulletin**. April 2006. Lot 101 – 200.

CONFERENCE PRESENTATIONS/PARTICIPATION

International Presentations:

1. **Golabi Mohammad H**. (2014). Using Vetiver Technology for Remediation of contaminated Soils and/or purification of waste water for agricultural uses. Presented at the: 4th International Conference on 'Environmental Challenges and Dendrochronology". Sari University of Agricultural Sciences and Natural Resources. **Suri, Iran**: 14-15 May, 2014. **Keynote Speaker**.

2. **Golabi, Mohammad H**. (2014). Environmental Impact of Land application of composted organic waste for soil quality improvement and agricultural sustainability. Presented at the: 4th International Conference on 'Environmental Challenges and Dendrochronology". Sari University of Agricultural Sciences and Natural Resources. **Suri, Iran**: 14-15 May, 2014. **Plenary speaker**.

3. **Golabi, M.H.** (2014). Soil management strategy for enhancing soil quality for higher and better crop yields. Presented at the: 20th World Congress of Soils: **Jeju, Korea**, June 8-13, 2014.

4. **Golabi, Mohammad H**. (2014). 'Soil Carbon Content and Sequestration". Presented at the: Multistate Research Projects for the NC - 1178 region. Manhattan, Kansas. **USA**. June 23-24, 2014.

5. **Golabi, Mohammad H**., Sayed Hassan, Dinku Endale, Bob Schlub. (2013). Evaluating the crop productivity and environmental impact of land application of composted organic waste on calcareous soils of northern Guam. *In:* Proceedings of the 2nd WASWAC world conference (the Threats to Land and Water). Le Meridian. **Chiang Rai, Thailand**. 4-7 September, 2013.

6. **Golabi, M. H**. (2013). "Higher crop yield from Healthier Soil via Soil Quality enhancement strategies on the calcareous soils of northern Guam". Presented at the: '4th International Conference on Conservation Agriculture in Southeast Asia (CA-SEA4)' at the University of Battambang in **Battambang, Cambodia**. December 9 - 13, 2013. **Invited Speaker.**

7. **Golabi, Mohammad H**. (2013). "Innovative Zero waste technology for a sustainable solid waste management". Presented at the: 'International Conference on Solid Waste 2013 – Innovation in Technology and Management'. **Hong Kong**. SAR, P.R. China. 5-9 May, 2013. **Invited Speaker**.

8. **Golabi, Mohammad H.**, 2013. Carbon content and distribution of eroded soils of northern Guam. Presented to the: Multi-State Research Projects Annual Meetings/Conferences titled: "Crop Residue Removal for Biofuel held at the College of Agriculture and Life Sciences, University of Wisconsin-Madison, **USA**, 3-6, June 2013.

9. **Golabi, M. H.** (2013). Attended at the Soil Carbon Conference by the: 'International Union of Soil Sciences' meetings. University of Wisconsin-Madison, **USA**. 3-6 June, 2013.

10. **Golabi, Mohammad H.** (2013). Using Vetiver Grass Technology (VGT) for preventing sedimentation at the shorelines of Guam. *In:* the Proceeding of the 68th International Annual Conference of Soil and water Conservation Society, Reno, Nevada, **USA**. 21-24, July 2013.

11. **Golabi, Mohammad H.** (2013). "Ecosystem Approach for Restoring Severely Eroded Soils- Case study in Guam. University of Philippines, Los Banos (UPLB), **Philippines**. 25-26 March, 2013. **Guest Lecturer.**

12. **Golabi Mohammad H.** (2013). Development of a research protocol for Using Biochar as a rehabilitation technique on degraded Gagil soils of Yap and also for its effect on carbon sequestration on eroded soils. A Research Collaboration with the Research/Extension division of the College of Micronesia-FSM. **Yap-FSM**. 2-6 July, 2013. **Invited Research Collaborator**.

13. Golabi, M.H., 2012. Large Scale Composting operation and the effect of land application of compost on crop growth and performance in Northern Guam'. Soil Science Society of America's (SSSA, 2012 Annual Meetings and Conferences. October 21- 24, 2012. Cincinnati, Ohio.

14. Golabi, M.H., 2012. How can we transform the municipal waste generation- An environmental crisis- into a valuable soil conditioner via a knowledge based resource recovery management strategy? International Research Conference for Globalization and Sustainability Conferences'. Iloilo city, Philippines. August 14 to 16, 2012.

15. Golabi, M.H., Kirk Johnson, Takashi Fujiwara, and Eri Ito. 2011. Waste generation in the island of Guam-A cooperative research Project with UOG and the Okayama University in Japan-Phase I: the Society. The Annual Report. Waste Management Research Center, Okayama University, Okayama, Japan. **Invited speaker**.

16. Golabi M.H[1]., and Samir. A. El-Swaify[2]. 2011. Integrated approaches for the rehabilitation of severely eroded soils for agricultural sustainability and natural resources

preservation of the Micronesian island of Guam. Cambodia conference.

17. Golabi, M.H., 2011. Management solution for enhancing soil organic carbon to improve crop productivity and maintain agricultural sustainability in the tropical island of Guam. Cambodia conference.

18. Using Vetiver Grass Technology (VGT) as a green and low cost Technology for Waste Water Treatment in Guam and the other islands of Micronesia. *Golabi Mohammad H., and Manuel Duguies. College of Natural and Applied Sciences, University of Guam. mgolabi@uguam.uog.edu. UOG, Sustainability conference.

19. Using Vetiver Grass Technology (VGT) as a green and low cost Technology for Waste Water Treatment in Guam and the other islands of Micronesia. *Golabi Mohammad H. University Putra Malaysia.

20. Using Vetiver Grass Technology (VGT) as a green and low cost Technology for Waste Water Treatment in Guam and the other islands of Micronesia. *Golabi Mohammad H., and Manuel Duguies. College of Natural and Applied Sciences, University of Guam. mgolabi@uguam.uog.edu. College of Engineering, University of Singapore.

21. Golabi, M. H., Takeshi Fujiwara, Kirk Johnson. 2010. Waste Survey and Establishment of Solid Waste Management in Guam. Kick-off Meetings on: Practical Research and Education of Solid Waste Management based on the Partnership among Universities and Governments in Asia and Pacific Countries. University of Okayama Okayama City, Japan. July 2010. **Invited speaker**

22. Golabi, M.H., Samir A. El-Swaify, and Clancy Iyekar. 2010. Evaluating the soil carbon dynamics under cropping rotations and conservation tillage management on severely eroded soils of southern Guam. Long Beach California. Nov. 1-5, 2010

23. Golabi, M.H. 2009. Watershed Restoration by Using Vetiver Grass Systems for Downstream Water Quality Improvement in Southern Guam. USDA-CSREES National Water Conference. St. Louis Missouri. February 8-12, 2009.

24. Golabi, M.H., M. Duguies. 2009. Application of the Vetiver Grass Technology (VGT) for Wastewater Treatment: An innovative nutrient removal technology for Southern Guam. USDA-CSREES National Water Conference. St. Louis Missouri. February 8-12, 2009.

25. Golabi, M.H. S.A. El-Swaify. 2008. Evaluation of different conservation tillage practices for soil erosion control and their effect on crop yield on the severely eroded soils of southern Guam. ASA and GSA joint Annual Meeting. Houston, Texas, October 5-9, 2008.

26. Golabi, M.H., G.R.W. Denton. 2008. The role of soil components such as charge characteristics on the mobility of contaminants leached down gradient of the Ordot

Landfill area in central Guam. ASA and GSA joint Annual Meeting. Houston, Texas, October 5-9, 2008.

27. Golabi, M.H. S.A. El-Swaify, and Clancy Iyekar. 2008. How Adaptive is Conservation Tillage in Guam and what is the effect of Conservation Practices on Severely Eroded Soils of Southern Guam. Soil and Water Conservation Society Conference. Tucson, Arizona. July 2008.

28. Golabi, M.H., G.R.W. Denton, H.R. Wood, Y.Wen, and C. Iyekar. 2006. Soil Properties and its Impact on the Mobility of Contaminants Leached Down Gradient of Ordot Landfill in Central Guam. Annual Meetings of the American Society of Agriculture and Biological Engineering. Oregon, USA. July 2006

29. Golabi, M.H., P. Denney, and C. Iyekar. 2005. Management Solution for Improving Soil Organic Matter for Crop Productivity and Environmental Quality in the Tropical island of Guam. *In*: The proceedings of International Symposium for Management of Tropical Sandy Soils for Sustainable Agriculture, A holistic approach for sustainable development of problem soils in the tropics. Sponsored by IRD, IWMI, UNCCD, ISRIC and FAO. November 27 – December 2, 2005, Khon Kaen, Thailand. **Invited speaker**

30. Golabi, M.H., C. Iyekar, and M.J. Denney. 2005. Challenges and actions regarding the rehabilitation of degraded lands: Case study from the Pacific island of Guam. *In:* The proceedings of International Symposium on Land Degradation and Desertification. Sponsored by the Commission on Land Degradation and Desertification – COMLAN/UGI and published by Revista Sociedade & Natureza, Institute de Geografia UFU. Uberlandia – Minas Gerais, Brazil. May 2005.

31. Golabi, M.H., C. Iyekar, and M.J. Denney. 2004. Challenges and Actions regarding the Soil and Water management for Agricultural Sustainability and Environmental Integrity: Case studies from degraded soils of northern Iran and severely eroded soils of southern Guam. The 3rd International Conference on Land Resource Management and Ecological Restoration in Loess Plateau. Sponsored by the Chinese Ministry of Education and UNESCO and was held in Yangling, China. September 2004. **Invited speaker**

32. Denney Margaret, Mohammad H. Golabi, and C. Iyekar, University of Guam. 2004. Use of compost as alternative to synthetic fertilizers for agricultural productivity/sustainability on Guam. Presented at the Soil and Water Conservation Society 2004 Annual Conference. Held on July 24 – 28. St. Paul Minnesota.

33. Golabi, M.H., M.J. Denney, and C.Iyekar. 2004. Use of Green Manure and Composted Organic Wastes as an Alternative to Synthetic Fertilizers for Enhancing Crop Productivity and Agricultural Sustainability on the Tropical island of Guam. The 13th International Soil Conservation Organization Conference - Conserving Soil and Water for Society: Sharing Solutions. Brisbane, Queens land, Australia. July, 2004. www.isco2004.org

34. Golabi, M.H., M. J. Denney, C. Iyekar. 2003. Composting of Disposal Organic Wastes for Agricultural land use as Resource Recovery Management. American Society of Agronomy (ASA) annual meetings. Denver, Colorado, November 2-6, 2003

35. Golabi, M..H., T. E. Marler, Erica Smith, Frank Cruz, J.H. Lawrence. 2003. Sustainable Soil Management Techniques for Crop Productivity and Environmental Quality for Guam. International Seminars on Farmer's Use of Diagnostic Systems for Plant Nutrient Management. Sponsored by the Food and Fertilizer Technology Center for the Asian and Pacific Regions (FFTC/ASPAC), and the Rural Development Administration (RDA) of the Republic of Korea. August 11 – 15, 2003. Suwon, Korea. Invited by RDA and travel expenses were paid by FFTC/ASPAC. **Invited speaker**

36. Golabi, M. H., M.J. Denney, and C. Iyekar. 2003. Composting of disposal organic wastes for forest and agricultural land use as Resource Recovery Management. The 20th Pacific Science Congress, "Science and Technology for Healthy Environment". Bangkok, Thailand. March 17-21, 2003. **Guest lecturer**.

37. Golabi, M.H., C. Iyekar, G.Denton, R. Wood, and M. Ventura. 2003. Impact of Ordot Dump on Water quality of Lonfit River basin in Central Guam. The 20th Pacific Science Congress, "Science and Technology for Healthy Environment". Bangkok, Thailand. March 17-21, 2003. **Guest lecturer**

38. The Third International Conference on Vetiver and Exhibition: VETIVER and WATER, an Eco-Technology for Water Quality Improvement, Land Stabilization, and Environmental Enhancement. Sponsored by: Chinese Academy of Sciences, Guangdong Provincial Government, Chaipattana Foundation of Thailand, and The Vetiver Network. Held in Guangzhou, P.R. China. October 6 – 9, 2003. **Attended only**

39. Golabi, M.H., Greg Wiecko. 2002. Management of Eroded Soils for Enhancement of Productivity and Environmental Quality. American Society of Agronomy (ASA) annual meetings. Indianapolis, Indiana. November. 10-14. 2002

40. Golabi, M.H., 2002. Composting: A Resource Recovery Management. Invited speaker at the Environmental Conference in the Micronesian Island of Palau. June. 2002. Palau, FSM.

41. Golabi, M.H., 2002. Environmental Impact of Soil Erosion and Land Degradation in Moghan (Northern) and Behbahaan (Southern) Regions of Iran: An Observatory Report from Tokten-UNDP Mission to Iran. The 12th International Soil Conservation Organization Conference (ISCO). May 26-31, 2002. Beijing, China. Tsinghua University Press.

42. Golabi, M.H., G. Wiecko, 2002. Management of Eroded Soils for Enhancement of Productivity and Environmental Quality in Guam. Annual meetings of Soil Science Society of America, October 21-25, 2001. Charlotte, North Carolina.

43. Golabi, M.H., 2001. Soil and Water Management Concerns in Guam. Invited presentation. Department of Natural Resources and Environmental Management, College of Tropical Agriculture and Human Resources, University of Hawaii at Mona, Hawaii (UHM), Oct., 2001

44. Golabi, M.H., P. Soltanpour, 2001. Environmental Impact of Soil Erosion and Land Degradation in Moghan Regions of Iran. Annual meetings of Soil Science Society of America, October 21-25, 2001. Charlotte, NC.

Local Presentations:

1. **Golabi, M.H**., Kirk. Johnson, Takeshi Fujiwara, and Eri Ito. (2012). an island adrift in a tidal wave of consumerism analysis on solid waste generation effected by the population growth and social lifestyle on Guam. University of Guam's Island Sustainability Conference. Hyatt Regency Hotel, Guam. April 2012.

2. Golabi, M.H., Waste to Energy: Marine lab. August, 2011.

3. Khosrowpanah Shahram, Mark Lander, Sydonia Manibusan, and Mohammad H. Golabi. 2012. The Hydrologic Response of the Piti-Asan Watershed to Development. UOG Sustainability Conference. UOG, Guam

4. Golabi, M.H. Manuel Duguies, Julie Shane. 2011. An Innovative Technology for Wastewater Treatment by using Vetiver Grass Systems. UOG CLASS Annual Conference. March 2011.

5. Golabi, M.H., Using Vetiver to protect Shorelines from Sedimentation: Example: Pago Bay Construction site situation. POET (Marine lab weekly seminars). April 2010.

6. Golabi, Mohammad H., Agrieultural Value of Vetiver Grass as a valued crop. Southern district Soil Conservation. Summer, 2011.

7. Golabi, M.H. Manuel Duguies, Julie Shane. 2009. An Innovative Wastewater Treatment System by using Vetiver Grass Technology. UOG CLASS Annual Conferenee. Mareh 2009.

8. Use of Vetiver Grass for Wastewater Treatment in Southern Guam. 2008. CLASS Annual Conferences. University of Guam. March, 2008.

9. Esfahaan Waste Management: A Model for Guam. 2008. Presented as a Guest Speaker at the Marine Lab Monthly Seminar Function, University of Guam.

10. Golabi, M..H. 2006. Composting an Alternative to Commercial Fertilizer for Sustainable Agriculture in the Pacific Islands of Micronesia. Presented at the Nutrient Management Training/workshop. Sponsored by the USDA-NRCS Pacific Basin Office. July 10 – 12, 2006.

11. Golabi, M.H., C. Iyekar, G. Denton, and R. Wood. 2002. Impact of Ordot Dump on Water Quality of Lonfit River Basin in Central Guam. *Invited speaker*, Research Advisor Annual meeting, University of Guam, Mangilao, Guam. October 2002

INTERNATIONAL INVITED OPPORTUNITIES

Guest Lecturer: (2013). "Ecosystem Approach for Restoring Severely Eroded Soils- Case study in Guam. University of Philippines, Los Banos (UPLB), Philippines. 25-26 March, 2013.

External Review Assignment: External examiner (2013) for Mr. Muhammad Shafiq's PhD Thesis entitled: 'Rapid composting technology and its fertilizer perspective in Rice-Wheat system'. Punjab University in Lahore. 142pp (reviewed and provided editorial comments).

Guest Lecturer: Invited and supported by the University of Okayama to observe the waste management facilities and plant operation and present lectures on waste management systems. September 2009.

***Panel Member*:** The 3rd International Conference on Land Resource Management and Ecological Restoration in Loess Plateau. Yangling, China. September 2004. Sponsored by the Chinese Ministry of Education and UNESCO. Invited and supported by UNESCO

Consultant: Invited and supported by Palingenesis Manufacturing, Inc. located in Manila, Philippines to observe the plant operation and present similar model on waste management systems. May 2003.

***Session Chair*:** International Conference on Farmer's Use of Diagnostic Systems for Plant Nutrient Management. Suwon, Korea. August, 2003. Sponsored by the Food and Fertilizer Technology Center for the Asian and Pacific Regions (FFTC/ASPAC), and the Rural Development Administration (RDA) of the Republic of Korea. Invited and supported by RDA and FFTC/ASPAC.

INSTRUCTIONAL ACTIVITIES

Courses Thought:

1. Tropical Soil Management and Fertility (AG 480)
2. Principles of Soil Sciences (AG/NS 380)
3. Principles of Soil Sciences Laboratory (AG/NS 380L)
4. Environmental Soil Science (AG 481/G)
5. Environmental Soil Science Laboratory (AG 481/G -L)
6. Environmental Seminar (EV 504)
7. Waste Management (EV 653)

New Courses Developed:

1. Environmental Soil Science for Undergraduate level (AG 494)
2. Environmental Soil Science for Graduate level (EV 594)

Courses Improved:

1. Tropical Soil Management and Fertility (AG 480)

Special Project Instructing and Mentoring

1. Administered Introduction to Soil Sciences (AG 190)
2. Administered Analytical Soil Science Project (AG 490)
3. Teaching Assistant for Soil Science (AG 390)
4. Special Project on Soil Science Subjects (AG 390)
5. Graduate Student Thesis (EV 690)

Co- Teaching:

1. Environmental Ecology (EV 510)
2. Agricultural sciences (AG 101)

PROFESSIONAL MEMBERSHIPS

1. American Society of Agronomy
2. Soil Science Society of America
3. Crop Science Society of America
4. Tau ehapter of the Phi Beta Delta. the honor society for international scholars
5. World Association of Soil & Water Conservation (WASWC)
6. Vetiverim – The Pacific Rim Vetiver Network (Country Representative, representing Guam)

CURRICULUM VITAE – Hui Gong Jiang

P O Box 5348, UOG Station, Mangilao, GU96923, USA
Phone: (671) 735-2144 Fax: (671) 734-4600
E-mail: hgong@uguam.uog.edu

Education

Ph.D. Department of Wildlife and Fisheries Sciences, Texas A&M University
M.Sc Institute of Oceanology, Chinese Academy of Sciences
B.Sc Ocean University of China

Professional Experience Highlight

Aug. 2011 ---- present Associate Professor, College of Natural and Applied Sciences, University of Guam.
Feb. 2007 ---- Jul. 2011 Assistant Professor, College of Natural and Applied Sciences, University of Guam.
Apr. 2003 ---- Jan. 2007 Shrimp Health Assurance Manager and ShrimpTraq Database Manager, Sygen International.

Publication

Gong, H. 2015. Specific Pathogen Free *Penaeus vannamei* Breeding Program at University of Guam. Aquaculture Magazine 41(4). 72-73.

Gong, H. 2014. Prebiotics in Shrimp Aquaculture. Aquaculture Magazine 40(6). 62-64.

Gong, H. 2014. Probiotics in Shrimp Aquaculture. Aquaculture Magazine 40(3). 60-61.

Gong, H., J.W. Brown. 2012. Using Yellowfin Tuna Roe in a Shrimp Maturation Diet. World Aquaculture 43(3). 48-52.

Gong, H., D.H. Jiang, F. Alig, A.L. Lawrence. 2012. Effects of dietary protein level and source on the growth and survival of two genetic lines of specific-pathogen-free Pacific white shrimp, *Penaeus vannamei*. Aquaculture 338-341. 118-123.

Gong, H. 2010. Promoting Health Management of Shrimp Aquaculture on Guam and Commonwealth of Northern Mariana Islands. Asian Fisheries Science 23 (4). 447-461.

Ciobanu, D.C., J.W.M. Bastiaansen, J. Magrin, J.L. Rocha, D.-H. Jiang, N. Yu, B. Geiger, N. Deeb, D. Rocha, **H. Gong**, B.P. Kinghorn, G.S. Plastow, H.A.M. van der Steen, A.J. Mileham. 2010. A major SNP resource for dissection of phenotypic and genetic variation in Pacific white shrimp (*Litopenaeus vannamei*). Animal Genetics 41(1). 39-47.

Velasco-Escudero, M., **H. Gong**. 2010. Applications of SCOs for Aquaculture (Book chapter). Single Cell Oils: Microbial and Algal Oil. (In print).

Gong, H., D.H. Jiang, A. Rojas. 2009. Testing may help increase IHHNV tolerance in Pacific white shrimp. Global Aquaculture Advocate 12(6). 67-69.

Recent Presentation/Abstracts

Gong, H., 2015. Evaluation and Dietary Protein and Energy Utilization Efficiency in Various families of *Penaeus annamei*. World Aquaculture Jeju 2015 May 26-30.

Gong, H., 2014. Research Approaches in Promoting Aquaculture on Guam. World Aquaculture Adelaide 2014, Jun. 7-11.

Gong, H. J.W. Brown. 2013. Evaluation of Viral Nervous Necrosis and Iridovirus Presence in the Wild caught Coral Grouper, *Plectropomus areolatus*. Europe Aquaculture '13. Trondheim, Norway, Aug. 9-12.

Gong, H., J. Channarong, Y. Zhang, A. Swatdipong, L. Ngensiri. 2013. Genetic Diversity Analysis and Parentage Assignment of Specific Pathogen Free *Penaeus vannamei* Breeding Stocks on Guam Using Microsatellite Markers. Aquaculture America 2013, Nashville, Feb. 21-25.

Gong, H. J.W. Brown. 2012. Is Pelagic Tuna Roe Suitable for Maturation Diet for Penaeus vannamei Broodstock? Aquaculture America 2012, Las Vegas, Feb. 29-Mar. 2.

Gong, H. D.H. Jiang, J. Bastiaansen, A. Lawrence. 2011.Evaluation of Genetic and Dietary Interaction for Penaeus vannamei. Aquaculture America 2011, New Orleans, Feb. 28-Mar. 4.

Gong, H. 2009. Recent Development of Shrimp Breeding and Broodstock Management in Guam. Aquaseed International conference, Kaohsiung, Taiwan, Nov. 10-12.

Gong, H. 2009. Promoting Health Management of Shrimp Aquaculture on Guam and Commonwealth of Northern Mariana Islands. Integrated technologies for advanced shrimp production symposium, Honolulu, Hawaii, Oct. 13-15.

Competitive Grants Awarded (in the past five years)

1. Value Added Approach for Tuna Fish Roe: Local Ingredient for Shrimp Maturation Diet?
   PI: Hui Gong
   Funding Agency: CTSA
   Funding: $50,000 for 2009-2010.

2. Genetic variability study of specific pathogen free pacific white shrimp Penaeus vannamei on Guam

PI: Hui Gong.
Funding Agency: TSTAR
Funding: $186.960 for 2009-2011.

3. Collection and health certification of coralgrouper broodstock in the Mariana islands
PI: Hui Gong
Funding Agency: USDA Center for Tropical and Subtropical Aquaculture
Funding: $ 56,256 for 2010-2013.

Graduate Student/Post-docs Advised

- Graduate students (MS level): Jarupan Chanarong, Tao Huang
- Post-graduate: Yanhao Yang (M.S.)
- Post-docs: Yongde Zhang, Jianhua Xiong, Yongzhen Zhao, Yun Li

Institutions of Collaboration

University of Arizona, Texas A&M University, University of Hawaii, Oceanic Institute, University of Kasetsart (Thailand), Chulalongkorn University (Thailand), Guangxi Institute of Fisheries (China), University of Hainan (China), Shanghai Ocean University (China), Secretariat of the Pacific Community, University of Wageningen (Netherlands)

ROMINA KING

Curriculum Vitae

P.O.B 5383, UOG Station, Mangilao, GU 96925
T. 671.686.0946 Email: rominaking@gmail.com Skype: romina.king

EDUCATION

Ph.D Geography.....June 2015
University College Cork, Ireland
Dissertation: Vulnerability and Adaptation to Climate Change in Guam – A case-study of the perceptions, attitudes, behaviors, and knowledge of a small rural community towards their watershed
Supervisor: Professor Robert Devoy, Ph.D

M.Sc, Geographical Information Systems.....2013
School of Geography – University Southampton, Southampton United Kingdom
Dissertation: Assessing the Quality of Volunteered Geographic Information – Examining the completeness and accuracy of a dataset from OpenStreetMap in relation to a dataset from Ordnance Survey Ireland with regard to the River Lee, Cork, IRE.
Supervisor: Dr. Jim Wright

M.A. Micronesian Studies 2008
Micronesian Studies Program - University of Guam, Mangilao, GU
Thesis: Measuring Attitudes and Perceptions of Micronesian Immigrants with Respect to Guam's Marine Protected Areas: A Socioeconomic Assessment
Supervisor: Dr. Donald Rubinstein; Thesis Committee: Dr. Jenny McIlwain, Dr. John Peterson

B.Sc. Economics 2001
Boston College, Chestnut Hill, MA

EMPLOYMENT HISTORY

Assistant Professor of Geography (TT).....August 2015 – present
University of Guam - College of Liberal Arts and Social Sciences, Geography Department
Immediate supervisor: Dean James Sellmann, Ph.D
Responsibilities included teaching Introduction to Geography, Introduction to Physical Geography, Physical Geography of Micronesia, Geography of the Pacific, Cultural Ecology, Cultural Ecology of Micronesia, Natural Resource Conservation and Management. Also serves as the Pacific Islands Climate Science Coordinator at the UOG Center for Island Sustainability and designated POC for Climate Change at UOG. The Pacific Islands Climate Science Center is a USGS consortium.

Geography Instructor.....January 2014 – June 2015
University of Guam - College of Liberal Arts and Social Sciences, Geography Department
Immediate supervisor: Dean James Sellmann, Ph.D
Responsibilities included teaching Introduction to Geography, Introduction to Physical Geography, Physical Geography of Micronesia, Geography of the Pacific. Provided service to the Center for Island Sustainability by coordinating Pacific Islands Climate Science activities.

Watershed Coordinator.....July 2013 – Oct 2013
The Research Corporation of the University of Hawaii (RCUH)
2800 Woodlawn Drive Suite 200, Honolulu, HI 96822; T. 808.988.8300
Immediate supervisor: Evangeline Lujan, GCMP Administrator

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Curriculum Vitae

P.O.B 5383, UOG Station, Mangilao, GU 96925

T. 671.686.0946 Email: rominaking@gmail.com Skype: romina.king

Responsibilities included finalizing the watershed management plan initiated in 2010 and conducting a valuation of the Maneil-Geus watershed with regard to flooding.

Teaching Assistant.....2010 – 2013
University College Cork
Cork, IRE
Immediate supervisor: Professor Robert Devoy
Responsibilities included occasional lecturing for M.Sc Coastal Zone Management and GIS Programme.

Tutor .....2010 – 2013
University College Cork Plus and Disabilities Support Services
Immediate supervisor: Maeve Bent (UCC Plus); Mairead O'Sullivan (UCC DSS)
Responsibilities include tutoring underprivileged undergraduates and undergraduates with learning disabilities. Modules reviewed included Introduction to Physical Geography; Economic Geography; Cultural Geography; Quaternary Environments and Geomorphology; Geographical Research Methods; Geographic Data Analysis; Atmospheric Environment; Marine Environments; Coastal and Marine Geomorphology; Nature of Geography; Coastal Zone Management; Spatial Analysis.

Watershed Coordinator/GIS Specialist.....July 2010 – Oct 2010
The Research Corporation of the University of Hawaii (RCUH)
2800 Woodlawn Drive Suite 200, Honolulu, HI 96822; T. 808.988.8300
Immediate supervisor: Dr. Bob Richmond, RCUH; and Evangeline Lujan, GCMP Administrator
Responsibilities include coordinating a watershed management plan for the Manell/Geus watershed located in Southern Guam

Natural Resource Management/GIS Specialist .....Jan 2008 – Jan 2009
IMSG/Bureau of Statistics and Plans — Guam Coastal Management Program (GCMP) P.O. Box 2950, Hagatna, GU 96932; T.671.472.4201/2/3 F.671.477.1812
Immediate supervisor: Evangeline Lujan, Administrator
Responsibilities included assisting the GCMP with various coastal zone management issues, with a focus on coral reef conservation. See description for NOAA Coral Reef Management Fellow.

NOAA Coral Reef Management Fellow-Guam ..... Jan 2006 -Jan 2008
IMSG/ECO/ERT/Bureau of Statistics and Plans — Guam Coastal Management Program
P.O. Box 2950, Hagatna, GU 96932; T. 671.472.4201/2/3; F. 671.477.1812
Immediate supervisor: Evangeline Lujan, Administrator and Guam's Point of Contact (POC) for Coral Reef Initiative
Responsibilities included assisting the GCMP with coral reef conservation strategies addressing threats to coral (land-based sources of pollution, overfishing, lack of awareness, recreation misuse, and coral bleaching and disease); assisting the POC with the management of CRI grants (reporting, compiling and organizing) and coordination of local action strategy groups; assisting the POC with regional initiatives such as the Micronesia Challenge and local programs such as Guam Guardians of the Reef; assisting the POC with formal communications (e.g. editing of position statements) and

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visualization creation (e.g., powerpoint presentations, Web site development, and posters).

Geographical Information Systems Analyst .....Apr 2004 – Jan 2006
Guam Environmental Protection Agency — Information Services Branch
17-3304 Mariner Avenue, Tiyan, GU 96913
Immediate Supervisor: Michael Mann, USEPA Region 9 Special Assistant
Responsibilities included the inventory and organization all GIS related hardware, software, locally stored databases and shape-files. This was in preparation for a Guam Facility Registry System (GFRS), an Oracle database containing spatially referenced data pertaining to facilities, sites or places subject to environmental regulations or of environmental interest in order to create high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from local Government of Guam agencies. This GFRS transfers its data via XML to the United States Environmental Protection Agency's Facility Registry System (USEPA FRS). The USEPA FRS provides Internet access to a single integrated centralized database of comprehensive (air, water, and waste) environmental information about facilities, sites or places for the United States and territories.

Archaeological Field Technician.....Feb 2003 – Feb 2004
Paul H. Rosendahl, Inc. (PHRI) Maite, GU
Immediate Supervisor: David Defant
Responsibilities included mapping, surveying, determining spatial reference, excavation and exhumation of human skeletal remains and cultural and historical artifacts.

Environmental Specialist .....Oct 2001 – Feb 2003
Allied Pacific Environmental Consulting
POB 5091, Agana, GU 96932
Immediate Supervisor: Joel Sablan
Responsibilities included map creation for EIS, projects, and presentations and constructing an internal information management system.

Further studies

Archeological Field School – Nu'uanu Valley, Oahu, HI
University of Hawaii at Manoa and the Bishop Museum
Learned technical skills required in archaeology such as excavation, exhumation, cataloging, surveying. Assisted in the excavation of King Kamehameha III's summer palace.

Pacific Crest Outward Bound—Pemberton, British Columbia, Canada
Participated in a 32-day mountaineering outdoor education course, called "Leave No Trace" in the Coast Mountains of Vancouver, BC.

Skills

Proficiency with MS Word, Excel, Access, and Powerpoint; Adobe Creative Suite 5 (Photoshop, Illustrator, InDesign, Acrobat Pro); ESRI ArcGIS (ArcInfo, ArcEditor, and ArcView); SPSS; Sigma Plot

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CERTIFICATIONS

PADI Advanced Open Water SCUBA; GIS Certifications:

DATES ATTENDED	NAME OF COURSE	COURSE DESCRIPTION	QUALIFICATIONS OBTAINED
26-28 MAY 2004	COASTAL APPLICATIONS USING ARCGIS	Demonstration of applications of this technology to real-world coastal issues such as population growth, sensitive habitats, and marine protected areas	NOAA COASTAL SERVICES CENTER CERTIFICATE
29 NOV - 01 DEC 2004	BUILDING GEODATABASES I	Provided an overview of the structure and capabilities of the geodatabase. Learned how to create a geodatabase, migrate existing GIS data to a geodatabase, and edit and maintain data stored in a geodatabase. Covered some advanced geodatabase topics including how to build a geodatabase topology; maintain data integrity using subtypes, attribute domains, and relationship classes; and create a geodatabase schema.	ESRI CERTIFICATE
02-03 DEC 2004	BUILDING GEODATABASES II	Learned how to model and work with linear features stored in the geodatabase, focusing on the geodatabase's geometric network and linear referencing capabilities. Learned the nuances of working with geometric networks as we created and edited geometric networks and performed geometric network analysis. In the linear referencing portion of the course, we learned how to create routes and measures; edit linear features in the field using ArcPad; migrate coverage arcs, routes, and events to the geodatabase; and perform linear referencing analysis.	ESRI CERTIFICATE
19-20 SEP 2005	INTRODUCTION TO ARCIMS	Introduction to ArcIMS as an integrated approach for creating and maintaining geography based Web sites. ArcIMS offers powerful GIS capabilities in an easy to use framework, changing the way users can access and interact with Internet mapping applications. Provided a conceptual overview of how GIS mapping works on the Internet.	ESRI CERTIFICATE
21-23 SEP 2005	ARCIMS ADMINISTRATION	Learned how to set up and maintain a production ArcIMS server requires implementing effective strategies to ensure performance, security, and reliability. Learned how to protect and maintain ArcIMS servers and configure firewalls. Course topics included tuning ArcIMS services, setting up secure servers, applying hardware sizing, and important networking skills. Learned advanced installation and configuration techniques with a focus on distributed installations. Covered creating, configuring, and monitoring ArcIMS connections to ArcSDE servers.	ESRI CERTIFICATE
25-28 JULY 2006	GIS ANALYSIS FOR COASTAL APPLICATIONS	Refresher course offered by NOAA to Government of Guam. Learned how to deal with data collection, assimilation, geographic representation, and reporting. Learned to extend their GIS skills to create, edit, manage, and analyze spatial data. This training will also help develop advanced skills directly in the ARCGIS software for data analyses	NOAA COASTAL SERVICES CENTER CERTIFICATE

GRANTS, HONORS and AWARDS

National Parks Service Grant – Approximately 14,700 USD of the total grant for GIS support in the construction of a cultural geospatial database and provision of staff development in the form of GIS training with ArcGIS.....2014

Center for Island Sustainability Grant – Approximately 8000 USD was used to research and write a policy paper analyzing the feasibility of a sustainability policy for the island of Guam.....2014

NOAA Coral Reef Management Grant (CRI-GU-12)—Approximately 20000 USD was allocated for

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the development of a socio-economic analysis of the Manell-Geus Watershed.....2012

NOAA Coral Reef Management Grant (CRI-GU-10) – Approximately 13000 USD of the total grant was allocated for a the development of a watershed management plan for the Manell-Geus.....2010

NOAA Coral Reef Management Grant (CRI-GU-09)- Approximately 60000 USD of the total grant was allocated for a proposed project: Relational Database with spatial intelligence capability for data collected from activities outlined by the Guam Island-- Wide Coral Reef Ecosystems Monitoring Plan.....2009

NOAA Coral Reef Management Fellowship 2006-2008
Awarded to six people to live and work in a US jurisdiction to assist with coral reef conservation strategies and natural resource management.

Graduate Student of the Year – University of Guam 2005
For exemplary studies and community service

Government of Guam Resolution 2004
Official commendation for advancing community consciousness of violence against women and women's rights through the organization of V-Day UOG 2004 and the local production of Eve Ensler's "Vagina Monologues"

Boston College AHANA Grant Recipient 2000
Awarded to one junior for original research. Project involved the study of bat caves in the Yasawa Group, Fiji under the guidance of Dr. Terry Hunt, University of Hawaii

Conferences and Publications

King, R. 2015. Vulnerability and Adaptation to Climate Change in the Manell and Geus watersheds, Southern Guam – A case-study of the perceptions, attitudes, behaviors, and knowledge of a small rural community towards their watershed. *Presentation given at the 2015 Center for Island Sustainability Conference at the Hyatt Regency Hotel, Tumon, GU.*

King, R. & Baza I. 2015. Sustainable Island Development Policy for Guam – *Presentation given at the 2015 Center for Island Sustainability Conference at the Hyatt Regency Hotel, Tumon, GU.*

King, R. & Baza I. 2014. Sustainable Island Development Policy for Guam – Policy Paper. Center for Island Sustainability, UOG.

King, R. (2014) The Manell-Geus Watershed Management Plan. Bureau of Statistics and Plans Guam Coastal Management Program.

King, R. 2013. The Manell-Geus Watershed, poster. Funded through NOAA Grant No. NA10NOS4190208. Bureau Statistics and Plans Guam Coastal Management Program.

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T. 671.686.0946 Email: rominaking@gmail.com Skype: romina.king

King, R. 2013. The Manell-Geus Watershed Informational Brochure. Created for NOAA Personnel for Guam's consideration as a chosen site for Habitat BluePrint. Bureau of Statistics and Plans Guam Coastal Management Program.

King, R. 2013. The Manell-Geus Watershed Community Action Plan (CAP) Brochure. Created for 27 August 2013 Village Meeting, Merizo Mayor's Office. Funded through NOAA Grant No. NA11NOS4820007. Bureau of Statistics and Plans Guam Coastal Management Program.

King, R., 2013. Pertinent Findings of the Household Survey Measuring Attitudes, Perceptions, and Knowledge of the Residents of the Manell-Geus Watershed, conducted in 2010 (powerpoint presentation). Presented to the working group for the Manell-Geus Conservation Action Plan Meeting held on 31 August -02 September 2013, NRCS Field Office, Guam.

King, R. 2013. Proximity of coastline and wetlands to sirens on Guam (map and table produced for Homeland Security). Bureau of Statistics and Plans Guam Coastal Management Program.

King, R., 2012. Attitudes and Perceptions of Climate Change in the Manell-Geus Watershed - Puppet Show. Presentation given at the University College Cork Doctoral Showcase.

King, R., 2011. Adaptive capacity of small island states with regard to freshwater resources. – Case Study: Merizo, Guam. Presentation given to Geography Department University College Cork.

King, R., 2010. Building adaptive capacity to climate change in the coastal environments of small Pacific Island States: Developing and implementing effective reactive and proactive adaption strategies at the local level with regard to water resource management in response to climate change in Guam. Presentation given to Geography Department University College Cork.

King, R. & Rubinstein, D., 2009. Measuring Perceptions and Attitudes of Guam's Micronesian Immigrant Community with regard to Guam's Network of Marine Preserves. In Proceedings from the Pacific Science Intercongress 2009. The 11th Pacific Science Inter-Congress -Pacific Countries and their Ocean:Facing Local and Global Changes (March 2-6, 2009). Tahiti, French Polynesia: Pacific Science Association.

King, R., 2008. Measuring Perceptions and Attitudes of Guam's Micronesian Immigrant Community with regard to Guam's Network of Marine Preserves. M.A. Thesis (Micronesian Studies). University of Guam.

King, R., 2008. "Guardians of the Reef", Presentation given at the International Coral Reef Symposium "Educational Activities: For K-12 Teachers or Students". Ft. Lauderdale, FL.

King, R (2006). "Keep Your Butts...Off the Beach – Guam is not an Ashtray!" The Pacific Daily News, Man, Land, and Sea supplement 8 April, p.8.

CURRICULUM VITAE

RACHAEL TAITANO LEON GUERRERO, PH.D., R.D.N., L.D.
COLLEGE OF NATURAL & APPLIED SCIENCES
UNIVERSITY OF GUAM – UOG STATION
MANGILAO, GUAM 96923-5221
PHONE (671) 735-2026 • FAX (671) 734-4222
EMAIL: RACHAELTLG@UGUAM.UOG.EDU

EDUCATION:

May 98	Doctor of Philosophy, Colorado State University Major: Human Nutrition
December 92	Master of Science, University of Hawaii at Manoa Major: Human Nutrition
May 89	Bachelor of Arts, University of Guam Major: Biology

PROFESSIONAL EXPERIENCES:

August 14 to Present	*Interim Associate Director*, Western Pacific Tropical Research Center, University of Guam, College of Natural and Applied Sciences Mangilao, Guam
Aug 08 to Present	*Professor,* University of Guam College of Natural and Applied Sciences — Division Agriculture & Life Sciences Mangilao, Guam
Aug 03 to July 08	*Associate Professor,* University of Guam College of Natural and Applied Sciences — Consumer & Family Sciences Unit Mangilao, Guam
June 98 to July 03	*Assistant Professor/Nutrition Specialist,* University of Guam College of Agriculture and Life Sciences — Consumer & Family Sciences Unit Guam Cooperative Extension Mangilao, Guam
June 94 to Aug 97	*Graduate Fellow,* University of Colorado Health Sciences Center Center For Human Nutrition Denver, Colorado
Aug 93 to May 94	*Graduate Teaching Assistant,* Colorado State University Department of Food Science and Human Nutrition Fort Collins, Colorado
May 91 to July 93	*Research Associate,* Hawaii Osteoporosis Center Honolulu, Hawaii
Aug 90 to July 92	*Graduate Research Assistant,* University of Hawaii Department of Food Science and Human Nutrition Honolulu, Hawaii
Aug 89 to July 90	*Graduate Teaching Assistant,* University of Hawaii Department of Food Science and Human Nutrition Honolulu, Hawaii
May 89 to Aug 89	*Research Assistant,* University of Guam Marine Lab

Mangilao, Guam

Aug 88 to Dec 88	*Undergraduate Teaching Assistant,* University of Guam Department of Biology Mangilao, Guam
June 88 to Aug 88	*Undergraduate Research Intern,* U.S. Department of Energy Savanna River Lab Aiken, South Carolina

PUBLICATIONS:

Novotny R, Fialkowski MK, Li F, Paulino YSN, Vargo D, Jim R, Coleman P, Bersamin A, Nigg CR, Leon Guerrero RT, Deenik, J, Kim JH, Wilkens LR. Systematic review of prevalence of young child overweight and obesity in the United States Affiliated Pacific region compared to the 48 contiguous states: a the Children's Health Living Program. Am J Pub Health, 2014;DOI:10.2105/AJPH2014.302283.

Leon Guerrero RT, Badowski G, Yamanaka A, Blas-Laguana M, Bordallo R, Buyum A, Wilkens LR, Novotny R. The vital role of cancer registries in the recruitment of an understudied minority population into a breast cancer study: Breast Cancer Risk Model For The Pacific. Hawaii J Med & Pub Health. 2014;73(10):335-340.

Fialkowski MK, DeBaryshe B, Bersamin A, Nigg C, LeonGuerrero RT, et al. A community engagement process identifies environmental priorities to prevent early childhood obesity: the Children's Healthy Living Program for Remote Underserved Populations in the Pacific Region (CHL). Maternal Child Health J, 2014;18:2261-2274. DOI 10.1007/s10995-013-1353-3.

LeonGuerrero RT, Novotny R, Wilkens LR, Blas, M, Chong M. Development and validation of a quantitative FFQ for Guam. [Abstract No. 628.8] The FASEB Journal. April 2014;628.8.

Aflague TF, Leon Guerrero RT, Boushey CJ. Adaptation and evaluation of the *WillTry* tool among children in Guam. Prev Chronic Dis J, 2014;DOI:10.5888/PCD11.140032.

Novotny R, Fialkowski MK, Areta AA, Bersamin A, Braun K, DeBaryshe B, Deenik J, Dunn M, Hollyer J, Kim J, Leon Guerrero RT, Nigg CR, Takahashi R, Wilkens LR. University of Hawai'i Cancer Center Connection: The Pacific Way to Child Wellness: The Children's Healthy Living Program for Remote Underserved Minority Populations of the Pacific Region (CHL). Hawaii J Med Public Health, 2013; Nov;72(11):406-8.

Snowdon W, Raj A, Reeve E, Guerrero RLT, Fesaitu J, Cateine K, Guignet C. Processed foods available in the Pacific Islands. Globilization and Health, 2013;9:53.

Wilkens LR, Novotny R, Fialkowski MK, Boushey CJ, Nigg C, Paulino YSN, LeonGuerrero RT, Bersamin A, Vargo D, Kim J, Deenik J. Children's Healthy Living (CHL) Program for Remote Underserved Populations in the Pacific Region: rationale and design of a community randomized trial to prevent early childhood obesity. BMC Public Health, 2013;13(1):944.

LeonGuerrero RT, Novotny R, Wilkens LR, Chong M. Development and validation of a quantitative FFQ for Guam. [Abstract No. 1004.1] The FASEB Journal. 2012;26:1104.1.

Paulino YC, Leon Guerrero RT. Women in Guam consume more calories on feast days than during non-feast days. Micronesica, 2011;41(2):223-235.

Leon Guerrero RT, Gebhardt SE, Holden JM, Kretsch MJ, Todd K, Novotny R and Murphy SP. White rice sold in Hawaii, Guam, and Saipan often lacks nutrient enrichment. Journal of American Dietetics Association, 2009;109:1738-1743.

Leon Guerrero RT, Murphy SP, Novotny R, Paulino YC. Diet and obesity among Chamorro and Filipino Adults on Guam. Asia Pacific Journal of Clinical Nutrition, 2008;17(2):216-222.

Paulino YC, Leon Guerrero RT, Aguon C. Nutrition analysis of a fiesta in Guam. Micronesica, 2008;40(1/2):233-244.

Martin CL, Murphy SP, Leon Guerrero RT, Davison N, Jung YO, Novotny R. The Pacific Tracker (PacTrac): Development of a dietary assessment instrument for the Pacific. Journal of Food Composition Analysis, 2008;21:s103-s108.

Colfax RS, Leon Guerrero RT, Perez KT. Lifestyle changes program for a Guam business: report on the development and start-up stages. Journal of International Business, 2007;6:1-10.

Paulino YC and Leon Guerrero RT. Women in Guam consume more calories on a party day compared to a regular day. [Abstract No. 692.14] The FASEB Journal. 2007; 21(5):A712.

Leon Guerrero RT, Murphy SP, Todd K, Kretsch M, Holden J. Variations in the Nutrient Profile of Rice Across Three Pacific Islands. [Abstract] Journal of the American Dietetics Association. 2006;106(8):A79.

Workman R, Leon Guerrero RT, Pinhey TK, Perez MP. Highlights of Findings From the 1999 Guam Study of Youth Risk Behaviors. Pacific Health Dialog: Journal of Community Health and Clinical Medicine for the Pacific. 2002;9(2):233-236.

Leon Guerrero RT, Workman RL. Physical activity and nutritional status of adolescents on Guam. Pacific Health Dialog: Journal of Community Health and Clinical Medicine for the Pacific. 2002;9(2):177-185.

Workman RL, Quinata JE, Pinhey TK, Perez MP, Leon Guerrero RT. Guam Youth Risk Behavior Survey 2001: Total Middle School and High school Sample Populations With Breakdowns By gender, Grade Level, and Ethnicity. Technical Report submitted to Curriculum & Instruction — Guam Department of Education; and Safe & Drug Free Schools and Communities Grant Program — Guam Department of Youth Affairs, February 2002.

Workman RL, Pinhey TK, Perez MP, Taitano, RT. 1999 Safe and Drug Free Schools and Communities Study of Youth Risk Behaviors — Drug Use, Fighting and Health-Risk Behaviors Among Youth on Guam. Technical Report submitted to Office of the Governor/Community Outreach Programs, Government of Guam, October 1999.

Benavente JC, Dusaban CH, Taitano RT. *Island Foods are Healthy: Guide for Nutritious Diets.* ADAP Instructional Materials: 99-7, 1999.

Taitano RT, Novotny R, Davis JW, Ross PD, Wasnich RD. Validity of a food frequency questionnaire for estimating calcium intake among Japanese and white women. Journal of the American Dietetics Association. 1995;95(7):804--806.

RESEARCH SUPPORT:

Ongoing Research Support

1054-CA-143727-01A1 (PIs: Robert Underwood and Carl Vogel) 12/1/2013 – 8/31/2015
NIH/NCI
Novel Approach to Assess Breast Density as a Risk Factor for Breast Cancer
The goal of this project is to develop the Electrical Breast Densitometer (EBD) device into a tool for breast cancer prediction and research.
Role: Co-Principal Investigator

5 U54-CA-143727-05 (PIs: Robert Underwood and Carl Vogel) 7/1/2013 – 8/31/2015
NIH/NCI

University of Guam/University of Hawaii Cancer Center Partnership
This grant supports the partnership between the University of Guam and University of Hawaii Cancer Center I cancer research, training, education, and outreach.
Role: Co-Principal Investigator, Guam

2013-68001-30335 (Novotny) 4/2011 – 3/2016
USDA-NIFA
Children's Healthy Living Program for Remote Underserved Minority Populations in the Pacific Region
The goal of this project is to set up the capacity for Pacific Island populations to prevent child obesity through a multi-level approach including training public health nutrition work force; conducting public health nutrition research; communicating health related information to the public; developing nutrition monitoring and surveillance systems; and building social, cultural, physical, and built environments to sustain changes.
Role: Guam Lead Investigator

Completed Research Support

1054-CA-143727-01A1 (PIs: Helen Whippy and Carl Vogel) 9/1/2009 – 8/31/2013
NIH/NCI
Development of a Breast Cancer Risk Model for the Pacific (BRISK)
Project goals: 1) Test the Gail Model 2 of breast cancer risk among postmenopausal women in the Pacific (Marianas Islands); and 2) Build a new Breast Cancer Risk Model for the Pacific (BCRMP).
Role: Co-Principal Investigator

2009-43100-05963 (PI: Rojas) 10/1/2009 – 9/30/2010
USDA-NIFA
55 Plus: Guam's Approach to Healthy Aging
The goal of this project is to promote healthy living and aging of Guam's elderly through nutrition and fitness by providing timely and practical information on the value of good nutritional health and access to health promotion activities. Desired results include: increased awareness and skills to make healthy eating choices, setting reasonable fitness goals and maintaining physical activity levels, and increased awareness and skills to deal with issues associated with chronic diseases.
Role: Co-Investigator

1056-CA-096254-01A1 (PIs: Helen Whippy and Carl Vogel) 9/1/2003 – 8/31/2006
NIH/NCI
Evaluation of Risk Factors for Chronic Disease Among Adults in Guam
Project goals: 1) develop tools to accurately measure food and nutrient intake; 2) conduct a survey of a representative sample of 125 adult Chamorros and Filipinos living on Guam; and 3) develop a food frequency questionnaire to be used in future studies of diet and health.
Role: Co-Principal Investigator

1056-CA-096278-01A1 (PIs: Helen Whippy and Carl Vogel) 9/1/2005 – 8/31/2007
NIH/NCI
Factors Associated with Betel Nut Use on Guam
Project goals: 1) Use the 2007 BRFSS on Guam to analyze betel nut chewing prevalence data; 2) Conduct a series of focus groups to expand the betel nut ingestion module of the BRFSS into a comprehensive questionnaire; 3) Pilot-test the full questionnaire among a second sample of betel nut users.
Role: Co-Investigator

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Mari Marutani	Professor
eRA COMMONS USER NAME (credential, e.g., agency login)	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
University of Hawaii, Honolulu, Hawaii	B.S.	1977	Horticulture
University of Hawaii, Honolulu, Hawaii	M.S.	1980	Horticulture
University of Hawaii, Honolulu, Hawaii	Ph.D.	1984	Horticulture

A. Work Experiences

1981 – 1984 Research Associate II of Horticulture (University of Hawaii).
1984 – 1991 Research Associate of Horticulture and Entomology (University of Guam).
1991 – 1994 Assistant Professor of Horticulture (University of Guam).
1994 - 2000 Associate Professor of Horticulture (University of Guam).
2000 - Present Professor of Horticulture (University of Guam).

B. Selected Grants Awarded:

- Recruitment and retention of students majoring agricultural Sciences at University of Guam. (PI: M. Marutani) USDA, NIFA, 2015-2016. ($150,305)
- Ecofeed Project, DOI UOG/CIS (PD/Coordinator: M. Marutani) 2014-2017. ($377,956)
- Sustainable agriculture utilizing a small-scale integrated farming system in Guam Sustainable agriculture in Guam: a small-scale integrated farming system in an insular urban environment. (PI: M. Marutani), Hatch Project, USDA, NIFA, 2013-2018. ($9,000/year)
- S-009: Plant Genetic Resources Conservation and Utilization. Regional Project, USDA, NIFA PI: M. Marutani (Guam); Administrative advisor, G.F. Arkin (GA). 2013-2018. ($10,000/year)
- Propagation and Outplanting Strategies for Guam's Rare and Declining Forest Species. (PI: M. Marutani) USDA: NIFA, McIntire Stennis. 2014-2018. ($10,000/year)
- Improvement of Resident Instruction in Agriculture and Food Science at University of Guam. (PI: M. Marutani) USDA, NIFA, 2014-2016. ($159,143)
- *Jatropha curcas* and *Calophyllum inophyllum* oils as renewable feed stocks for biodiesel production in Guam (PI: M. Marutani and J.A. Soria) 2012-2013. UOG Faculty Research Grant. ($12,500)
- Oil from Da'ok, *Calopyllum inophyllum* Kernels: Local Biomass in Potential Biofuel Production in Guam (PI: M. Marutani) 2012-2013. UOG Faculty Research Grant. ($12,500)
- Training Conference to Develop Certification Inspectors to Enable Organic Agriculture on Guam and the American Affiliated Pacific, USDA-Organic Agriculture Research and Extension Initiative (PI: L. R. Barber; co-PI, M. Marutani and J. McConnell) 2009-2011. ($41,616)
- Plant Extinction Prevention (PEP) Program—Guam and Hawaii Department of Agriculture Forestry Division to initiate the Plant Extinction Prevention Program in Guam. (Co-PIs. J. McConnell, M. Marutani, and J. Santos) USDA Forestry & Wild Life. 2009-2012. ($76,000)
- Customizing biodiesel derived from tropical trees. (PI: R. Ogoshi UH, M. Marutani co-investigator) US Department of Transportation SunGrant 2009-2011.($14,240 for Guam)
- Evaluation of hot pepper genotypes for growth and potential processed products in tropical islands USDA, Tropical & Subtropical Agricultural Research Special Grant (PI: M. Marutani) 2005-2007. ($204,950)
- Growth of tropical crops in response to organic amendments and indigenous arbuscular mycorrhizae USDA, Tropical & Subtropical Agricultural Research Special Grant (PI: M. Marutani and H. Valenzuela) 2005-2007. ($289,900)

C. Professional organizations:

American Society of Horticultural Science
American Society of Agronomy
International Society for Horticultural Science
Sigma Xi: Scientific Research Society

D. Honors and Awards:

Sigma Xi (The Scientific Research Society), 1989.
Phi Kappa Phi (The National Honor Society), 1983.
Gamma Sigma Delta (The National Agriculture Honors Society), 1979.

E. Selected refereed journal publications, book chapter, proceedings, and abstract/conference presentation

Marutani M. and Brown, J. 2014. Sustainable Horticultural System, Issues, Technology and Innovation: A Small-scale Integrated Farm System in a Tropical Insular Environment of Guam: A case study. Book chapter. pp.79-93.

Mari Marutani and John Brown. 2014. *Selection of Horticultural Crops for a Small-scale Integrated Farm System in the Tropical Environment of Guam. Oral report was presented at the American Horticultural Science Society Annual Conference at Orlando, FL July 29, 2014*

Mari Marutani and John Brown. 2014. *Sustainable Agricultural Systems: Issues, Technology and Innovation; Development of a small-scale integrated farm system in Guam. Oral report was presented at the Regional Island Sustainability Conference: Concept of Implementation: Achieving a sustainable Community at Guam, April 15-16, 2014.*

Mari Marutani and Mario Martinez. 2014. *Renewable feedstock for biofuel production; Can local plants produce biofuel in Guam? Oral report was presented at the Regional Island Sustainability Conference: Concept of Implementation: Achieving a sustainable Community at Guam, April 15-16, 2014.*

Mari Marutani, John Brown, Vic Artero and Bob Barber. 2013. *Country Profile: Aquaponics in the Territory of Guam. Oral report was presented at the SPC Aquaculture Expert Consultation: Aquaponics for the Pacific Islands region: review of opportunities and constraint. Cook island from September 23-27, 2013*

Marutani M. Y. Kimura, D. Miyaji and Y. Kishida. 2012. Potential food waste management system for agriculture in Guam. *In* Practical Research and Education of Solid Waste Management based on the Partnerships among Universities and Governments in Asia and Pacific Countries. *The Annual Report of FY2011,* Okayama University.

Marutani M and Y. Kishida. 2011. Survey on food waste utilization by hog farmers in Guam. *In* Practical Research and Education of Solid Waste Management based on the Partnerships among Universities and Governments in Asia and Pacific Countries. *The Annual Report of FY2010,* Okayama University.

Marutani, M. 2009. Field performance and nodulation of yardlong bean in the humid tropics. International Journal of Vegetable Science. 15:133-141.

F. Teaching:

1. Principles of Horticultural Sciences (AG 281), Tropical Agricultural Science Program, University of Guam.
2. Internship (AG498) Tropical Agricultural Science Program, University of Guam.
3. Vegetable Production (AG484) Tropical Agricultural Science Program, University of Guam
4. Agroecology (AG494G) Tropical Agricultural Science Program, University of Guam.
5. Member, Committee for Developing M.S. degree in Agriculture and Life Sciences at University of Guam.
6. Faculty, UOG Graduate Program, M.S. Degree in Biology and M.S. Degree in Environmental Science

G. Extension and other publication related to the proposed project:

Marutani, M. Shade covers extend degradation of an insecticide, carbaryl, on field-grown pakchoi. Guam CES FactSheet 2011-1. 2p.

Randall, J. and M. Marutani. 2009. Evaluation of five basil cultivars in Guam. Agricultural and Life Science Division, College of Natural & Applied Science, University of Guam. CES FactSheet 2009-1. 2p.

Tuquero, J. and M. Marutani. 2009. Corn seedlings grew better with Mycorrhizal inoculation in four irrigation regimes in Guam's calcareous soil. Agricultural and Life Science Division, College of Natural & Applied Science, University of Guam. CES FactSheet 2009-2. 2p.

Tareyama (Afaisen), S. and M. Marutani. 2009. A survey: How waste cooking oils from restaurants are disposed in Guam. Agricultural and Life Science Division, College of Natural & Applied Science, University of Guam. CES FactSheet 2009-3. 2p.

Marutani, M., G. Uehara, R. Paull, R. Ogoshi, B. Turano, and S. Afaisen. 2007. Bioenergy feedstock assessment in the Western Pacific Islands. The 21st Pacific Science Congress. Diversity and Changes: Challenges and opportunities for managing natural and social systems in Asia-Pacific. p.115.

James McConnell
College of Agriculture and Life Sciences
University of Guam 96923
Phone: (671) 735-2129
Fax: (671) 734-5600
e-mail: mcconnel@uguam.uog.edu

Degrees:
BS (Horticulture), 1978, Pennsylvania State University.
MS (Horticulture), 1980, University of Hawaii.
Ph.D. (Horticulture), 1984, University of Hawaii.

Professional Employment/Experience:
1984-1991: Assistant Professor of Horticulture (University of Guam)
1992-2002: Associate Professor of Horticulture, (University of Guam)
2003-Present: Professor of Horticulture, (University of Guam)
2012-2014: Agriculture and Life Science Division Chair

Courses Developed:
Urban Landscape Management
Scientific Digital Photography
Ornamental Crop Production in the Tropics
Introduction to Plant Science (Full online science lab course)
Principles of Horticultural Science
Horticulture Plant ID

Courses Taught:
Urban Landscape Management; Hybrid Course
Scientific Digital Photography
Ornamental Crop Production in the Tropics
Introduction to Plant Science; Delivery Face to Face and Online
Principles of Horticultural Science; Hybrid Course
Horticultural Plant ID; Hybrid Course

Grants Awarded since 2009:
2015-2017. Distance Education Grant for Institutions of Higher Education in Insular Areas. (PI: J. McConnell) $119,750.
2015-2016. CESU Agreement to Conduct Plant Surveys of Rare Plants. (PI:J. McConnell, E. Demeulenaere) $95,000
2015-2016. Seed Collection, Seed Storage, Propagation and Outplanting of *Serianthes nelsonii* and Species Being Considered for Listing Under the Endangered Species Act; US Fish & Wildlife Service. (PI:J. McConnell and E. Demeulenaere). $200,000.
2015-2016. CESU Agreement; Conservation of *Cycas micronesia* on Guam. (PI: J.McConnell, E. Demeulenaere). $45,000.
2014-2018. Genetic make-up of the Serianthes taxa. McIntire-Stennis. J. McConnell
2014-2015. Seed Collection, Seed Storage, Propagation and Outplanting of *Serianthes nelsonii* and Species Being Considered for Listing Under the Endangered Species Act; US Fish & Wildlife Service. (PI:J. McConnell and E. Demeulenaere) $100,000.
2014-2015. CESU Agreement to Conduct Plant Surveys of Rare Plants. (PI:J. McConnell, E. Demeulenaere and T. Marler). $275,000.
2014-2015. Seed Collection, See Storage, Tissue Culture and Propagation of Serianthes nelsonii and Species Being Considered for Listing Under the Endangered Species Act; US Fish & Wildlife Service. (PI: J. McConnell and Demeulenaere). $100,000.
2014-2015. Distance Education Grant for Institutions of Higher Education in Insular Areas. (PI: J. McConnell). $128,000.
2013-2015. Preserving Disappearing Biodiversity of Guam's and Hawaii Island Ecosystems, Phase II.(-Multi-state proposal with Hawaii). USDA/Forestry Western Competitive Stewardship Grant (PI: J. McConnell). $236,000.

2013-2014. Distance Education Grant for Institutions of Higher Education in Insular Areas. $85,000.

2013-2016. Guam's Forest Inventory and Analysis (FIA) Program and Micronesia Challenge'sTerrestrial Monitoring Program's Forest Inventory. (PI: A. Lehman, J. McConnell and E. Demeulenaere) US Forest Service Pacific Northwest Research Station. $220,000.

2011-2016. Sustainable Landscape Management in Guam. (PI: J. McConnell) Hatch.

2009-2011. Training Conference to Develop Certification Inspectors to Enable Organic Agriculture on Guam and the American Affiliated Pacific.CSREES Organic Agriculture. Research and Extension Initiative. (PI: L. R. Barber, M. Marutani, and J. McConnell).

2009-2012. Territory of Guam proposal to Improve Management Techniques for Hawaii/Guam Forest Biodiversity: Development of Guam Extinction Prevention (PEP) Program: Hawaii as a model. Forest Stewardship-Grant from USDA Dept. of Forestry. (PI: M. Marutani, and J. McConnel and J. Santos) $38,000.

Publications since 2004:

McConnell, J. 2011. Experiences Developing Online Lab Courses Delivered Using Moodle.HortScience 46(9):401.

McConnell, J. 2011. Digital Asset Management: Sorting and Annotating Your Images. HortScience 46(9):77.

McConnell, J. 2011. Experiences Developing Plant Biology as an Online Lab Course in Moodle.Botanical Society of America Annual Meeting. St. Louis, MI.

McConnell, J. 2010. Using Moodle and Multimedia Elements for Online Course Delivery at Land Grant Institutions in the Western Pacific. HortScience 45(8):67.

McConnell, J. 2010. Vinca Cultivar Trials in Guam. HortScience 45(8): 55.

McConnell, J. 2009. Multishot Techniques to Use with Digital Cameras for Optimizing Horticultural Photography. HortScience. 44(4): 1167.

McConnell, J. 2009. Evaluation of Vinca Cultivars for the Landscape or as Potted Plants in Guam. HortScience. 44(4): 1155.

McConnell, J. 2009. Innovative Cutting-Edge Techniques in Horticultural Photography. Computers in Horticulture Working Group. American Society for Horticultural Science Annual Meeting. St. Louis, MI.

Presentations:

McConnell, J. 2014. Tools for Enhancing the Development and Delivery of Online Courses.American Society for Horticultural Science Annual Meeting, Orlando, FL.

McConnell, J. 2014. Evaluation of Ground Covers for Use in Guam Landscapes.American Society for Horticultural Science Annual Meeting, Orlando, FL.

McConnell, J. 2014. The Guam Plant Extinction Prevention (GPEP) Program for Saving Rare Plants in Guam. American Society for Horticultural Science Annual Meeting, Orlando, FL.

McConnell, J. 2009. Innovative Cutting-Edge Techniques in Horticultural Photography. Computers in Horticulture Working Group. American Society for Horticultural Science Annual Meeting. St. Louis, MI.

CURRICULUM VITAE

NAME **YVETTE C. PAULINO, Ph.D.**

APPOINTMENT **Assistant Professor**
University of Guam

ADDRESS **School of Nursing and Health Sciences**
SNHS Building, Room 103
University of Guam
UOG Station, Mangilao, Guam 96923
EMAIL: yvettecpaulino@uguam.uog.edu
TELEPHONE: 1-671-735-2661

EDUCATION

2002	University of Guam, B.A., Biology
2005	University of Guam, M.S., Biology
2009	University of Hawaii, Manoa, Ph.D., Epidemiology

CERTIFICATIONS

2012 – Current	Basic Life Support for Healthcare Providers, American Heart Association
2012 – Current	Basic Life Support Instructor, American Heart Association

PROFESSIONAL SOCIETIES

American Association for Cancer Research
Minority-Serving Institution Faculty Scholar in Cancer Research
Minorities in Cancer Research Membership
Women in Cancer Research Membership

American Public Health Association
Epidemiology Section
Public Health Nutrition Section

American Society for Nutrition
Research Interest Section

International Epidemiological Association

Society for Epidemiologic Research

ELECTED POSITIONS

2014 – Current	**Senator**, Faculty Senate University of Guam, Mangilao, GU
2012 – 2014	**Member**, Research Council University of Guam, Mangilao, GU
2012 – 2013	**Chair**, Guam Comprehensive Cancer Control Coalition Mangilao, GU
2011 – 2012	**Vice Chair**, Guam Comprehensive Cancer Control Coalition Mangilao, GU
2010 – 2012	**Member**, Faculty Election Commission University of Guam, Mangilao, GU

PROFESSIONAL APPOINTMENTS

2011 – Current	**Assistant Professor**, School of Nursing and Health Sciences University of Guam Mangilao, Guam
2010	**Temporary Advisor**, Meeting on Control of Betel Nut and Tobacco Chewing World Health Organization Manila, Philippines
2010 – 2011	**Assistant Professor**, College of Natural and Applied Sciences University of Guam Mangilao, Guam
2006 - 2009	**Graduate Student Research Assistant**, Epidemiology Department Cancer Research Center of Hawaii Honolulu, Hawaii
2005 - 2006	**Adjunct Faculty**, Math and Science Department Guam Community College Mangilao, Guam
	Nutrition Researcher, Cancer Research Center of Hawaii Research Corporation of the University of Hawaii Honolulu, Hawaii
2003 - 2006	**NIH *RISE* Research Assistant**, Department of Natural and Applied Sciences University of Guam Mangilao, Guam

2002 - 2003	**Teacher**, Science Department Academy of Our Lady of Guam High School Hagatna, Guam
2001 (Summer)	**NIH *SPUR* Research Intern**, Department of Ecology University of Oregon Eugene, Oregon

TRAININGS

2002	Molecular Markers Workshop, University of Florida, Gainesville, FL
2003	Pacific Island Cancer Control Academy, University of California, Irvine, CA
2005	Pacific Island Cancer Control Supplemental Training, University of California, Irvine, CA
	Child Nutrition Assessment Training and Standardization, Northern Marianas College, Saipan, CNMI
2006	National Institutes of Health Human Research Subjects Online Training
2008	Statistical Analysis Software Training, University of Hawaii at Manoa, Honolulu, HI
2010	Oral Precancer Screening Workshop, University of Guam, Mangilao, GU
2010	Behavioral Risk Factor Surveillance System Training Workshop, Centers for Disease Control, Atlanta, GA
2011	Behavioral Risk Factor Surveillance System Courses (1. Multilevel Analysis, 2. Weighting BRFSS Dual Data Raking Methodology, and 3. Analyzing BRFSS Data Using SPSS), Centers for Disease Control, Atlanta, GA
2012	Anthropometry Standardization in Young Children, Children's Healthy Living Program for Remote Underserved Minority Populations in the Pacific Region (CHL), University of Guam, Mangilao, GU
2013	NIMHD Translational Health Disparities Course Scholar, National Institutes of Health, Bethesda, MD

PROFESSIONAL PRESENTATIONS

2001	Summer Program for Undergraduate Research, University of Oregon, Eugene, OR Oral Presentation: Determining Genetic Variability of ODR-3 Gene in *C.elegans*
2002	College of Arts & Sciences Conference, University of Guam, Mangilao, GU Oral Presentation: Genetic Variability of *Cyrtophora mollucenssis*
2003	Environmental Toxicology and Human Health Course, University of Guam, Mangilao, GU Oral Presentation: Effects of Selenium on Human Health
	Biology Seminar, University of Guam, Maniglao, GU Oral Presentation: Health Benefits of *Spirulina*
2004	College of Arts & Sciences Conference, University of Guam, Mangilao, GU Oral Presentation: Fiestas on Guam: An Analysis of Nutrition and Work-Input
	Society for the Advancement of Chicanos and Native Americans, Austin, TX Poster Presentation: Nutrition Analysis of Parties on Guam
2009	College of Liberal Arts and Social Sciences Conference, University of Guam, Mangilao, GU Oral Presentation: Betel Nut Chewers: Are they all the same?
2011	28th Annual Behavioral Risk Factor Surveillance System Conference, Atlanta, GA Poster Presentation: Describing Areca (Betel) Nut Chewing and Related Practices Using Data from the 2009 Behavioral Risk Factor Surveillance System (BRFSS)
	2011 Oceania Tobacco Control Conference, Brisbane, AU Poster Presentation: What can we learn from former areca nut chewers?
2012	2012 Intercultural Cancer Conference, Houston, TX Oral Presentation: Using Data to Empower Communities to Address Cancer Disparities
	2012 Pacific Global Health Conference, Honolulu, HI Oral Presentation: Validating Self-Reported History of Chronic Conditions among Areca (Betel) Nut Chewers in Guam

2015 Guam Social Work Conference, Tumon, GU
Oral Presentation: Trimming the Fat – A Community Affair

INVITED PRESENTATIONS

2005 3rd National Association of Social Workers Conference, Tumon, GU
Oral Presentation: Nutrition and Breast Cancer in Guam

Guest Speaker, Community Nutrition, University of Guam, Mangilao, GU
Oral Presentation: Nutrition and Cancer

Guest Speaker, Rotary Club of Guam, Tumon, GU
Oral Presentation: Risk Factors for Chronic Diseases on Guam

2010 Meeting on Control of Betel Nut and Tobacco Use, Manila, PH
Oral Presentation: Betel Nut Research Update in the Western Pacific

2011 Guest Speaker, Rotary Club of Guam, Tumon, GU
Oral Presentation: Research Update from the University of Guam Cancer Research Center

2012 Diabetes Forum, Tumon, GU
Oral Presentation: Comparing diabetics and high-risk residents using the BRFSS

First Women's Conference, Tumon, GU
Oral Presentation: Chronic Disease on Guam

Native Hawaiian and Pacific Islander Health Disparity and Health Equity Conference, Los Angeles, CA
Oral Presentation: Oral Cancer and Other Health Risks in Areca (Betel) Nut Chewers in the Marianas Islands

U54 Cancer Health Disparities Seminar, University of Guam, Mangilao, GU
Oral Presentation: Areca (Betel) Nut Research – Addressing Methodological Issues Through Validation

2013 U54 Cancer Health Disparities Seminar, University of Guam, Mangilao, GU
Oral Presentation: Areca (Betel) Nut Research – Describing Variability in Chewing Practices

2014	Guam Nurses Association Annual Nursing Conference, Tumon, GU Oral Presentation: Areca (Betel) Nut Research in the Western Pacific
	International Pacific Health Conference, Auckland, NZ Keynote Speaker: Being a Pacific Islander Health Researcher
	Annual Nursing Conference, Tumon, GU Oral Presentation: Weight Status of Children in the Guam Public School System
2015	Press Conference, Washington DC, USA Shining the Light on Childhood Obesity among Asian Americans, Native Hawaiians, and Pacific Islanders – Journal of Health Care for the Poor and Underserved Paper: Overweight and Obesity Prevalence among Public School Children in Guam

HONORS AND AWARDS

2004	Graduate Scholarship (Masters in Biology), University of Guam, U56 NIH-NCI Minority Institution-Cancer Center Partnership, Mangilao, GU
2006	Graduate Scholarship (Doctor of Philosophy in Epidemiology), University of Hawaii-Manoa, U54 NIH-NCI Minority Institution-Cancer Center Partnership, Honolulu, HI
2008	Federation of American Societies – Minority Access to Research Careers (FASEB MARC) Student Travel Award, Experimental Biology, San Diego, CA
	Achievement Rewards for College Scientists (ARCS) Scholarship Award, Honolulu Chapter, Honolulu, HI
2009	FASEB MARC Student Travel Award, Experimental Biology, New Orleans, LA
2012	Minority-Serving Institution Faculty Scholar in Cancer Research, American Association for Cancer Research, Chicago, IL
2015	Who's Who in the Government of Guam: 40 Years and Under, Association of Government Accountants, Tamuning, GU

PUBLICATIONS

PEER-REVIEWED MANUSCRIPTS

1. Leon Guerrero RT, **Paulino YC**, Novotny R, Murphy SP. Diet and obesity among Chamorro and Filipino adults on Guam. *Asia Pac J Clin Nutr.* 2008; 17(2):216-22. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762033/

2. **Paulino YC**, Leon Guerrero RT, Aguon CM. Nutritional analysis of a fiesta in Guam. *Micronesica.* 2008; 40:233-244. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2743493/

3. **Paulino YC**, Coleman P, Davison N, Lee S, Camacho T, Tenorio L, Murphy S, Novotny R. Nutritional Characteristics and Body Mass Index of Children in the Commonwealth of the Northern Mariana Islands. *J Am Diet Assoc.* 2008; 108(12):2100-2104.

4. Haddock RL, Damian Y, Duguies LA, **Paulino YC**. Guam's Influenza Epidemics of 2009. *Hawaii Medical Journal.* 2010; 69:50-51. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3123141/

5. **Paulino YC**, Novotny R, Miller MJ, Murphy SP. Areca (betel) nut chewing practices in Micronesian Populations. *Hawaii Journal of Public Health.* 2011; 3:19-29. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4322768/

6. **Paulino YC**, Leon Guerrero RT, Novotny R. Women in Guam consume more calories during feast days than during non-feast days. *Micronesica.* 2011; 41:223-235. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4286890/

7. Haddock RL, **Paulino YC**, Bordallo R. Viral hepatitis and liver cancer on the island of Guam. *Asian Pac J Cancer Prev.* 2013; 14:3175-3176. Available at: http://www.apocpcontrol.org/page/apjcp_issues_view.php?sid=Entrez:PubMed&id=pmid:23803099&key=2013.14.5.3175

8. Wilkens LR, Novotny R, Fialkowski MK, Boushey CJ, Nigg C, **Paulino Y**, Leon Guerrero R, Bersamin A, Vargo D, Kim J, Deenick J. Children's Healthy Living (CHL) Program for remote underserved minority populations in the Pacific region: rationale and design of a community randomized trial to prevent early childhood obesity. *BMC Public Health* 2013; 13:944. Available at: http://www.biomedcentral.com/1471-2458/13/944

9. Novotny R, Fialkowski MK, Li F, **Paulino Y**, Vargo D, Jim R, Coleman P, Bersamin A, Nigg CR, Leon Guerrero RT, Deenik J, Kim JH, Wilkens LR. Systematic Review of Prevalence of Young Child Overweight and Obesity in the United States-Affiliated Pacific Region Compared With the 48 Contiguous States: The Children's Healthy Living Program. *Am J Public Health* 2015; 105:22-35. Available at: http://ajph.aphapublications.org/doi/pdfplus/10.2105/AJPH.2014.302283

10. **Paulino YC**, Hurwitz EL, Warnakulasuriya S, Gatewood RR, Pierson KD, Tenorio LF, Novotny R, Palafox NA, Wilkens LR, Badowski G. Screening for oral potentially malignant disorders among areca (betel) nut chewers in Guam and Saipan. *BMC Oral Health* 2014; 14:151. Available at: http://www.biomedcentral.com/1472-6831/14/151

11. **Paulino YC**, Leon Guerrero RT, Uncangco AA, Rosadino MG, Quinene JC, Natividad ZN. Overweight and Obesity Prevalence among Public School Children in Guam. *J Health Care Poor Underserved* 2015; 26(2 Suppl):53-62.

12. Fenfang L, Wilkens LR, Novotny R, Fialkowski MK, **Paulino YC**, Nelson R, Bersamin A, Martin U, Deenik J, Boushey CJ. Anthropometric measurement standardization in the US-affiliated pacific: Report from the Children's Healthy Living Program. *Am. J. Hum. Biol.* 2015; ...

ABSTRACTS

1. **Paulino YC** and Leon Guerrero RT. Women on Guam consume more calories on a party day compared to a regular day. *FASEB J.* 2007. 21:692.14 [abstract] Available at: http://www.fasebj.org/cgi/content/meeting_abstract/21/5/A712?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&author1=paulino&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&sortspec=relevance&volume=21&resourcetype=HWCIT

2. **Paulino YC** and Leon Guerrero RT. Obesity status and body image of Chamorro and Filipino adults in Guam. American Public Health Association Conference, 2007. 3079.0 [abstract]. Available at: http://apha.confex.com/apha/135am/techprogram/paper_166234.htm.

3. Davison N, Barcinas C, Logologo S, **Paulino Y**, Gittelsohn J, Novotny R. Availability of Healthier Food Items in Three Pacific Island Locations. *J Nutr Educ Behav*. 2008; 40(4):S55-S56 [abstract]

4. **Paulino YC**, Coleman P, Davison NH, Lee SK, Camacho TB, Tenorio LF, Murphy S, Novotny R. Food and nutrient intakes of children in the Commonwealth of the Northern Mariana Islands. *FASEB J.* 2008; 22:1082.3 [abstract]. Available at: http://www.fasebj.org/cgi/content/meeting_abstract/22/1_MeetingAbstracts/1082.3

5. **Paulino Y**, Vijayadeva V, Davison N, Coleman P, Tenorio L, Camacho T, Novotny R. Dental and Dietary Correlates of Children in the Commonwealth of the Northern Mariana Islands. *FASEB J.* 2009; 23:550.25 [abstract]. Available at: http://www.fasebj.org/cgi/content/meeting_abstract/23/1_MeetingAbstracts/550.25

6. **Paulino Y**, Hurwitz E, Katz A, Novotny R, Wilkens L. Areca nut use is associated with obesity and arthritis in Guam: Results from the 2007 Behavioral Risk Factors Surveillance System (BRFSS). *Am J Epidemiol.* 2011; 173(Suppl):S1-S316. Available at: http://aje.oxfordjournals.org/content/173/suppl_11/S1.full.pdf+html – S227, Abstract 909

7. **Paulino YC**, Wilkens LR, Hurwitz EL, Katz AR, Novotny R. Validation of the Areca (Betel) Nut State-Added Questionnaire in the Guam Behavioral Risk Factor Surveillance System (BRFSS). American Public Health Association Conference, 2012. 4356.0 [abstract]. Available at: https://apha.confex.com/apha/140am/webprogram/Paper270791.html .

8. **Paulino YC**, Novotny R, Katz AR, Wilkens LR, Hurwitz EL. Development and validation of an areca (betel) nut usage measurement tool for Micronesia [abstract]. In: Proceedings of the 6th American Association for Cancer Research Conference on the Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Medically Underserved; 2013 Dec 6-9; Atlanta, GA. Philadelphia (PA): AACR; 2013. P. 169. Abstract nr B15.

9. **Paulino YC**, Leon Guerrero RT, Rosario J. Overweight and obesity of children in Guam. *FASEB J.* 2014; 28:1024.3 [abstract]. Available at: http://www.fasebj.org/content/28/1_Supplement/1024.3.

10. Li F, Wilkens L, Novotny R, Fialkowski M, **Paulino Y**, Nelson R, Bersamin A, Martin U, Jim R, Deenik J, Boushey C. Anthropometric standardization in the U.S. Affiliated Pacific: The Children's Healthy Living Program. *FASEB J.* 2014; 28:1024.6 [abstract].
Available at: http://www.fasebj.org/content/28/1_Supplement/1024.6

11. **Paulino YC**, Hurwitz EL, Wilkens LR, Novotny R, Miller MJ, Quinata KM. Pattern of areca (betel) nut chewing and obesity measures in Guam and Saipan, Mariana Islands. 20th International Epidemiologic Association World Congress of Epidemiology, 2014. [abstract]
Available at: https://wce.confex.com/wce/2014/webprogram/Paper3147.html.

12. **Paulino YC**, Hurwtiz EL. Making the case for clearly defining tobacco use in areca (betel) nut chewers. *American Public Health Association Conference, 2014.* 2051.4 [abstract].
Available at: https://apha.confex.com/apha/142am/webprogram/Paper308300.html.

13. Li F, Nigg C, McGlone K, Fialkowski M, Wilkens L, **Paulino Y**, Belyeu-Camacho T, Bersamin A, Areta A, Novotny R. Young Children's Screen Time and Obesity in the U.S. Affiliated Pacific: The Children's Healthy Living Program. *FASEB J.* 2015; 29:902.21 [abstract]. Available at: http://www.fasebj.org/content/29/1_Supplement/902.21.short?relatedurls=yes&legid=fasebj;29/1_Supplement/902.21.

14. **Paulino Y**, Rosadino MG, Uncangco A. Validation of self-reported obesity measurements from the Guam Youth Risk Behavior Surveillance System. *FASEB J.* 2015; 29:747.9 [abstract]. Available at: http://www.fasebj.org/content/29/1_Supplement/747.9.short.

15. Quichocho L, Dejesa MJ, Sablan M, Wang D, Misa B, Aquino M, **Paulino Y**. Describing the Smoking, Nutrition, Alcohol, Physical Activity, and Obesity (SNAPO) health indicators of students at the University of Guam. *American Public Health Association Conference, 2015.* 335500 [abstract]. Available at: https://apha.confex.com/apha/143am/webprogram/Paper335500.html.

16. Jung C, Lowman E, **Paulino Y**, Salas J, Taitano J, Escalera E. An assessment of obesity, stress, and sleep patterns of college students at the University of Guam. American Public Health Association Conference, 2015. 335567 [abstract].
Available at: https://apha.confex.com/apha/143am/webprogram/Paper335567.html.

NON-PEER-REVIEWED PUBLICATIONS

1. **Paulino Y**. 2005. Women at Risk. *Pacific Daily News*, 23 July, p.16.

2. **Paulino YC**. (2009). Describing and Measuring Variability of Areca catechu (Betel Nut) Chewing in Micronesian Populations in Guam. (Doctoral Dissertation).
Available at: http://search.proquest.com/docview/304893557

3. **Paulino YC**. 2010. Party the Healthy Way. *Pacific Daily News*, 13 September, p.4-5.

4. Guam Comprehensive Cancer Control Coalition. Guam Cancer Facts and Figures 2003-2007. Guam Department of Public Health and Social Services: Mangilao, GU (2009). Available at: http://dphss.guam.gov/sites/default/files/pdf/Guam%20Cancer%20Facts%20%26%20Figures,%20Revised%20February%202011.pdf

5. Uncangco AA, Badowski G, David AM, Ehlert MB, Haddock RL, **Paulino YC**. First Guam BRFSS Report 2007-2010. Guam Department of Public Health and Social Services: Mangilao, GU (2012). Available at: http://www.dphss.guam.gov/sites/default/files/pdf/Guam%27s_First_BRFSS_Annual_Report_2007-2010.pdf

RESEARCH SUPPORT

COMPLETED

1056-CA-096278-01A1 (Whippy) 9/1/2006 – 8/31/2009
NIH/NCI
Factors Associated with Betel Nut Use on Guam
The major goals of this project are to collect baseline data on betel nut use among Micronesian betel nut chewers on Guam, and to use the qualitative information to inform the development of a betel nut measurement tool.
Role: Graduate Student Research Assistant/Project Coordinator

1U54CA143728-01 (Whippy) 9/1/2009 – 8/31/2013
NIH/NCI
Development of protocols for studying oral precancerous lesions and health risks in betel nut chewers in Micronesia
The major goals of this project are to develop the methods for detecting oral precancerous lesions among betel nut chewers, and to test the feasibility of studying oral precancerous lesions and other health risks as they relate to betel nut chewing in Micronesia.
Role: Guam Lead Investigator

1U54CA143728-01 (Underwood) 5/1/2012 – 12/31/2014
NIH/NCI
The influence of Areca (betel) nut chewing on the oral microbiome in Micronesia
The major goal of this project is to collect pilot data to identify features of the oral microbiome associated with areca nut chewing; and to identify features associated with pre-cancerous intra-oral lesions.
Role: Guam Lead Investigator

CURRENT

2011-68001-30335 (Novotny) 4/2011 – 4/2016
USDA
Children's Healthy Living Program for Remote Underserved Minority Populations in the Pacific Region (CHIL)
The goal of this project is to set up the capacity for Pacific Island populations to prevent child obesity through a multi-level approach including training public health nutrition work force; conducting public health nutrition research; communicating health related information to the public; developing nutrition

monitoring and surveillance systems; and building social. cultural, physical, and built environments to sustain changes.
Role: Guam Co-investigator

1UL1MD009596 (Crespo) 9/26/2014 – 6/30/2019
NIH BUILD
Enhancing Cross-disciplinary Infrastructure Training at Oregon (EXITO) Program
The training grant supports innovation in creating research career pathways for underrepresented and diverse students, targeting students of Hispanic, African American, American Indian, Alaska Native, and Pacific Islander heritage.
Role: Guam Co-investigator

XXXXXXXX (Underwood) 9/1/2015 – 8/31/2020
NIH/NCI
Betel Nut Intervention Trial (BENIT)
The aims of this project are to: 1) test the efficacy of an intensive group-based betel nut cessation program in betel nut chewers from Guam and Saipan, and 2) quantitatively determine the efficacy of the group-based betel nut cessation intervention trial using bio-verification.
Role: Guam Lead Investigator

Gerhard J. Schwab

University of Guam
Tel: 735-2961
Email: gerhard..schwab@uguam.uog.edu

Employment

1996 - present	**University of Guam** ***Mangilao, Guam*** Professor in Social Work
2002 - present	**University of Applied Sciences** ***Dornbirn, Austria*** Annual Visiting Lecturer
1990 - 1995	**University of Michigan** ***Ann Arbor, Michigan*** Teaching Assistant, Research Assistant
1987 - 1990	**Archdiocese of Agana** ***Agana, Guam*** Director of Youth Ministry
1981 - 1986	**Austrian Institute for Development Cooperation** ***Mount Hagen, Papua New Guinea*** Youth Director
1978 - 1981	**Caritas** ***Feldkirch, Austria*** Social Worker in Drug Rehabilitation Program

Education

1998	**Ph.D. in Social Work and Psychology** University of Michigan, Ann Arbor, Michigan
1994	**Master of Arts (Psychology)** University of Michigan, Ann Arbor, Michigan
1993	**Master of Social Work** University of Michigan, Ann Arbor, Michigan
1988	**Master of Human Relations** University of Oklahoma, Anderson Air Force Base, Guam

1981 **Diplom Sozialarbeiter**
Sozialakademie Bregenz, Austria

Publications

2012 (in press) **Social Work for a Sustainable Micronesia** (with Vivian Dames, Joliene Hasugulayag, and Lisalinda Natividad). In Sharlene Furuto "*Social Welfare in East Asia and the Pacific.* Columbia Unitversity Press, New York.

2010 **Entwicklung aus der Sicht des Anderen** (with Heinz Allgäuer-Hack and Hans Eder). In Hans Walz, Irmard Teske, Edi Martin *"Menschenrechtsorientiert wahrnehmen – beurteilen – handeln"*, Interact Publisher, Luzern, Switzerland

2007 Mao-Sheng Ran, Cecilia Lai-Wan Chan, Eric Yu-Hai Chen, Cui-Ping Tang, Fu-Rong Lin, Li Li, Si-Gan Li, Wen-Jun Mao, Shi-Hui Hu, Gerhard Schwab, Yeates Conwell. **Mortality of Geriatric and Younger Patients with Schizophrenia in the Community**. *Suicide and Life-Threatening Behavior.*

2006 **U.S. Military and U.S. Welfare: Partners in (De)Colonizing Micronesian Islands** (with Vivian Dames). In Katherine van Wormer, Social Welfare and Social Work: The U.S. in Global Perspective, Thomson Publishing, Belmont, CA, pp. 62-64

2002 **Social Encyclicals of the Catholic Church**. In John Tropman, *The Catholic Ethic and the Spirit of Community*, Georgtown University Press, 2002, pp. 231-247.

1999 **Knowledge Development in Social Work: Issues of Inclusion and Exclusion**. Peer reviewed conference proceedings of *"Promoting Inclusion – Redressing Exclusion: The Social Work Challenge"*, Brisbane, Australia, September 26-29,1999

1998 **Men versus Men: The Social Construction of Masculinities in Guam**. Peer reviewed conference proceedings of *"Enhancing Social Integration: Structure, Process and Intervention for Social Development"*, Bangkok, Thailand, November 17-21, 1997

1996 **Working with Raskal Gangs in the Highlands of Papua New Guinea**. In Linda Grobman (Ed.) *Days in the Lives of Social Workers; W.H. Communications,* Harrisburg, Pennsylvania. 1996

1996 **Similarities and Differences: Building Blocks of a Marianas Spirituality**. UMANIDAD, *Vol. IV, Number One, pp. 33-43*

1996 **Co-Evolution of Families and Social Service Organizations: Opportunities and Limitations for Partnerships?** Peer reviewed conference proceedings, *Asia Pacific Regional Social Services Conference,* Christchurch, New Zealand , November 1995, pp. 179-183

Major Presentations

2012	**Politische Verwantwortung der Sozialen Arbeit.** guest speaker at the Vorarlberg Chapter of the National Association of Social Workers in Austria, Rankweil, May 30, 2012.
2012	**Health Disparities: Results of and Causes for Policies** (with Margaret Hattori-Uchima); presented at the 2012 Guam Social Work Conference: Social Work Matters – Policies for Best Practices. Tumon, Guam, March 29-30, 2012.
2012	**National Social Work Policies for Guam: Best Kept Secrets** (with Joliene Hasugulayag and Tricia A. Lizama) presented at the 2012 Guam Social Work Conference: Social Work Matters – Policies for Best Practices. Tumon, Guam, March 29-30, 2012.
2011	**Soziale Arbeit in Micronesien: Herausforderungen und Möglichkeiten**; presented at the Austrian National Social Work Conference "Mut zur Armut", Dornbirn, Austria, June 5th, 2011.
2006	**Toward a Contemporary Indigenous Transformation of Mental Health Care Systems**; presented at the "Transforming Mental Health Systems in Our Pacific Islands" conference, Westin Hotel, Tumon, Guam, October 25–27, 2006.
2006	**Micronesia: Crosscurrents of Colonialization and Globalization - Hidden Treasures of Human Securities;** presented (in absentia) at the "Globalization, Development, and Human Security in the Asia-Pacific Region" Conference, Chonburi, Thailand; 18 – 20 October 2006
2006	**Theorizing to Get through Hell: Preparing for the Next Global Pandemic in Guam;** presented at the Government of Guam Pandemic Flu Planning Conference, Hilton Hotel, Tumon, Guam: July 20, 2006.
2006	**Master of Social Work: Graduate Education to Promote Mental Health and Social Well-Being.** presented at the 2006 Guam Social Work Conference, Tumon, Guam; March 28 – 30, 2006.
2005	**Ethical Decision Making: Easier Said Than Done;** presentation with Cathy Illarmo and Vincent Pereda, 2005 Guam Social Work Conference, Hilton Hotel, Tumon, Guam: March 30, 2005
2004	**Globalization in Micronesia: Challenges and Opportunities for Social Work:** presented at the International Federation of Social Workers and the International Association of Schools of Social Work GLOBAL SOCIAL WORK CONGRESS 2004 in Adelaide, Australia (October 2 – 5, 2004)
2004	**Graduate Social Work Education in Guam: Its Need and Promise for Guam's Socio-Economic Development**; presented at the 2nd Annual

	NASW Regional Training Conference, with Michael Liberatore, Vivian Dames, Tricia Lizama; Tumon, Guam (March 25, 2004)
2004	**Social Work: The Practice of Ethical Choices**; presented at the 2nd Annual NASW Regional Training Conference, with Catherine Illarmo, Rosita Mahony, Vincent Pereda, and Monica Thinkham; Tumon, Guam (March 26, 2004)
2003	**What Makes a Social Worker a Social Worker**, presented at the 1st Annual NASW Regional Training Conference, Tumon, Guam. (March 29, 2003)
2002	**Guam Association of Social Workers: New Partnernships in the Making**; presented at the 22nd Annual Conference of the Guam Association of Social Workers. Tumon, Guam. (March 28, 2002)
2001	**NASW Policy Statements Regarding Violence**; presented at Guam Association of Social Worker Seminar, Tumon, Guam (April 10, 2001)
2001	**The Future of GASW: Dilemmas and Opportunities**; presented at the 21th Annual Conference of the Guam Association of Social Workers. Tumon, Guam. (March 23, 2001)
2001	**BSW Graduates of UOG: Prepared to Do the Job**; presented at the 21th Annual Conference of the Guam Association of Social Workers, together with Vivian Dames, Tumon, Guam. (March 22, 2001)
2001	**Esta Masa: GASW's Birthing of the NASW Guam Chapter**; presented at the 21th Annual Conference of the Guam Association of Social Workers, together with Board of Directors of Guam Chapter NASW; Tumon, Guam (March 21, 2001)
2000	**Social Work Profession in the Asia Pacific Region: Implications for Social Work in the U.S.**; presented at the 18th Annual BPD Conference, Destin, Florida (October 20, 2000)
2000	**Characteristics and Pre-requisites for Social Development**; presentation and facilitation of focus groups at the Northern Pacific Justice and Development Seminar of the Pacific Catholic Bishops Conference, Koror, Palau (June 2000)
2000	**Social Work in the Asia-Pacific Region: Lessons for the Future of Social Work on Guam**; at the 20th Annual Conference of the Guam Association of Social Workers. Tumon, Guam (March 2000)
1999	**Subjective Knowledge about AIDS and Sexual Risk Behavior of Chamorro and Filipino Teens in Guam**; at the Education for Life Conference Tumon, Guam. (November 1999)
1999	**Catholic Social Teachings as a Challenge for Good Government**; presentation and facilitation of focus groups at the Justice and

	Development Seminar of the Pacific Catholic Bishops Conference. Majuro, Marshall Islands (October 1999)
1999	**Ethnicities and Masculinities in the Making in Guam**; presented at the Micronesian Studies Seminar of the University of Guam. Mangilao, Guam (October 1999)
1999	**Knowledge Development in Social Work: Issues of Inclusion and Exclusion**, presented at the International Federation of Social Worker Conference, "Promoting Inclusion – Redressing Exclusion: The Social Work Challenge", Brisbane, Australia (September 26-29,1999)
1999	**Politics of Knowledge: Cross-Currents of Social Work and Social Sciences in Guam**; presented at the 19th Annual Conference of the Guam Association of Social Workers (March 26, 1999)
1998	**BSW Alumni Organizing as Empowerment Practice**; presented at the 18th Annual Conference of the Guam Association of Social Workers; together with Nelson Pascua, Marie Pereda, and Eliza Vicente;. Tumon, Guam (March 16-18, 1998)
1997	**Men versus Men: The Social Construction of Masculinities in Guam.** presented at the Asia-Pacific Regional Conference of Asian and Pacific Association of Social Work Education and International Federation of Social Workers Bangkok, Thailand. (November 16 to 19, 1997)
1997	**The Many Faces of Guam's Families: Family Variation and Gender Socialization in Guam**; presented at the 17th Annual Conference of the Guam Association of Social Workers. Tumon, Guam. (April 1997)

Robert L. Schlub
Extension Specialist

Cooperative Extension Service
College of Natural and Applied Sciences
UOG Station, Mangilao, GU 96923
Tel. (671) 735-2089, Fax (671) 734-1244
E-mail: rlschlub@uguam.uog.edu

Education

BS: 1973, Ohio State University, in Plant Pathology
MS: 1976, Ohio State University, in Plant Pathology
PhD: 1979, Michigan State University, in Plant Pathology

Experience

1995-Present	Extension Agent III, IV, and Specialist; Guam IPM Coordinator; Guam RREA Principle Investigator; Co-coordinator Guam Western Plant Diagnostic Network, and Agriculture program instructor.
1980-1984	Assistant Professor/Extension Plant Pathologist at Louisiana State University
1979-1980	Post-Doctoral Research Scientist at USDA Soilborne Diseases Laboratory Beltsville, Maryland

Subject Matter Area

Plant Disease Diagnosis and Vegetable Pathology

Extension Activities:

1995-Present	Advisement of clientele on horticulture and plant diseases issues for Guam and the region through farm visits, workshops, and production of extension literature.

Research Activities:

2011-Present	Screening tomato varieties for resistance to Ageratum yellow vein virus
2009-Present	Etiology of *Casuarina equisetifolia* decline in Guam
2002-2008	Characterization of *Corynespora cassiicola,*
2002	Cultivar evaluation of vegetable soybeans on Guam
1998-2000	Occurrence and severity of diseases of eggplant, pepper, and tomato on Guam
1995-1997	Occurrence and severity of cucurbit diseases on Guam

Journals

Dixon, L. J. **R. L. Schlub**, K. L. Pernezny, and L. E. Datnoff. 2009.Host Specialization and Phylogenetic Diversity of *Corynespora cassiicola*. Phytopthology 99:1015-1027.

Schlub, R. L. and Grelen,L.B. 1983. Influence of hot water and areated steam treatments on sugarcane germination. The Sugar Journal 46:4-5.

Schlub, R.L., Grenlen, L.B. and Kamso-Pratt, J.M. 1985. Influence of soil moisture on germination of *Ustilao scitaminea* chlamydospores. Indian J. Agr. Sci. 55:110-114.

Schlub, R.L., and Johnson, S.A. 1982. Control of Phytophthora on pepper using captafol and methalaxy. The Philippine Agriculturist 65:215-219.

Schlub, R.L., and Lockwood, J.L. 1981. Etiology and epidemiology of *Pythium ultimum* seedling rot of soybean. Phytopathology 71:134-138

Schlub, R.L., and Lockwood, J.L, and Komada, H. 1981. Colonization of soybean seeds and plant tissue by Fusarium species in soil. Phytopathology 71:693-696.

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Abstracts and Posters

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Ayin, C.M., **Schlub, R.L.**, and Alvarez, A.M. 2013. Identification of bacteria associated with decline of ironwood trees (Casuarina equisetifolia) in Guam. Poster in proceedings of 2013 APS annual meeting Austin, Texas, Phytopathology 103:P422.

Marutani, M., J. Tuquero, **R. Schlub** and J. McConnell. 2005. Response of vegetable crops to mycorrhizal inoculation in a calcareous soil in the tropics. HortScience 40:1000.

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Schlub, R.L. 2011. Soil Fertility and Nutrient Management for Guam and the Northern Mariana Islands. Guam Cooperative Extension Service Publication. 60p.

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Marutaini, M., **Schlub, R.L.** 2002. Cultivar evaluation of vegetable soybeans on Guam.

Micronesica Supplement 7:93-100.

Yudin, L. and **Schlub, R.L**. and 1998, Guam Cucurbit Guide, Guam Cooperative Extension book.

Prem Singh

Assistant Professor, Agricultural Engineering
Agricultural Experiment Station
College of Applied and Natural Sciences
Mangilao, Guam 96923.
Tel (671) 735-2135
Email: psinghedu@gmail.com

University of Guam, Mangilao, GU (Jan. 1990 - present)
Specialty areas include: Microirrigation - automation, scheduling, design aspects relating to deep seepage; soil-water-plant interrelations affecting irrigation scheduling and automation, plant growth modeling - dynamic soil moisture regime modeling, fertigation and irrigation management of vegetable crops in the tropics. weather stations for agricultural research.

Have conducted extensive field experiments towards developing automated microirrigation scheduling systems that will reduce deep seepage and reduce groundwater pollution, particularly under shallow, very permeable calcareous soils. Developing fertigation management practices for vegetable crops like cucumbers and headcabbage under tropical conditions has been the other objective for the research.

Teaching mathematics and statistics courses since 2007, and agricultural engineering courses since 1990. Have developed online course material, testss and quizzes for Introduction to Statistics class using Moodle platform.

North Carolina State University ,NC (Aug. 1977 - Jan. 1988)
Conducted Ph.D. dissertation research at Agricultural Experiment Station, Lewiston, NC. Developed a model for simulating soil moisture dynamics and its influence on root growth and root distribution in a soil profile for a peanut crop. Dissertation title:
Simulation of Root Growth and Soil Moisture in a Peanut Growth Model.

Testing and parameter fitting of a watershed model for simulation of surface runoff and groundwater recharge.

National Remote Sensing Agency, Secunderabad, India (May 1975 - Aug. 1977) :
Applications engineer for irrigation and water resources applications of remote multispectral scanner data.
Indian Agricultural Research Institute, New Delhi, India (Aug. 1972 - May 1975)
Conducted research in the area of stochastic rainfall analysis and irrigation scheduling of winter wheat. Thesis title : Optimization of Irrigation Scheduling Based on Stochastic Rainfall Analysis.

Related Research Projects :
PI: USDA T-STAR project: Field Determination of Optimal Wetted Soil Volume, Irrigation Scheduling, and Nutrient Management for Watermelons in Tropical, Shallow, Calcareous Soils, 2001-2004.

Participating Scientist - Western Regional Research Project - W-128 : Microirrigation Technologies for Protection of Natural Resources and Optimum Production, 1999-2004.

Selected Publications:

Singh, P., Brown, R.W., Matanane, F. 2005. Guam Agricultural Climatic Data System: 2001 Climatic Data and Summaries. Guam Agriculture Experiment Station Technical Bulletin 464. pp 35.

Singh, P., Brown, R.W., Matanane, F. 2004. Guam Agricultural Climatic Data System: 2000 Climatic Data and Summaries. Guam Agriculture Experiment Station Technical Bulletin 463. pp 26.

Singh, P., Brown, R.W. 2004. Tropical Storm Tingting Strikes UOG Watermelon Experiment. Northern Weekly, Pacific Daily News. August 4, 2004. pp 6.

Singh, P., Brown, R.W. 2003. UOG Workshop Offers Tips on Melon Production. Northern Weekly, Pacific Daily News. July 30, 2003. pp7.

Singh, P., Brown, R.W., Matanane, F. 2002. Guam Agricultural Climatic Data System: 1999 Climatic Data and Summaries. Guam Agriculture Experiment Station Technical Bulletin 389.

Singh, P., Schlub, R., Cruz, F., 2002. Irrigation, Fertigation, and Drainage. Eggplant, Pepper, and Tomato Production Guide for Guam, Guam Cooperative Extension, pp. 36-39.

Singh, P. and R.W. Brown. 2000. Controlling Crop Soil Moisture. Irrigation Management Series: IM-001, Guam Cooperative Extension Publication. 1p.

Singh, P. and R.W. Brown. 2000. Switching Tensiometer Installation and Maintenance. Irrigation Management Series: IM-002, Guam Cooperative Extension Publication. 2p.

Singh, P. and R.W. Brown. 2000. Switching Tensiometers (STs) – Save water & Increase Yields. Irrigation Management Series: IM-003, Guam Cooperative Extension Publication. 1p.

Singh, P. and R.W. Brown. 2000. Microirrigation Scheduling of Head Cabbage in Shallow Guam Cobbly Clay Soils –Switching Tensiometers Set-up and Operation. Irrigation Management Series: IM-004, Guam Cooperative Extension Publication. 1p.

Abstracts and Conference Presentations:

Singh, P. (2008). Student Learning Behavior. *The 29th CLASS Conference, University of Guam.* March 11, 2008. Abstract & Presentation.

Singh, P and R.W. Brown (2005). Evaluation of Number of Drip Lines per row on Watermelon Production in the Cobbly Clay Soil of Northern Guam. *The 26th CLASS Conference, University of Guam.* March 7, 2005. Abstract & Presentation.

Brown, R. W and P. Singh (2005). Influence of Rainy, Cloudy, and Windy conditions on Watermelon Production in Northern Guam. *The 26th CLASS Conference, University of Guam.* March 7, 2005. Abstract & Presentation.

Singh, P. and R.W. Brown (2004). Effect of Sunn Hemp Grown in Shallow Guam Cobbly Clay Soil on Leachate Nitrogen Levels. *The 25th CLASS Conference, University of Guam.* March 8-9, 2004. Abstract & Presentation.

Brown, R.W. and P. Singh (2004). Guam Agricultural Climatic Data System Annual Report Year 2000. *The 25th CLASS Conference, University of Guam.* March 8-9, 2004. Abstract & Presentation.

Singh, P. and R.W. Brown (2003). Evaluation of a Microirrigation System Design Parameter for Watermelon in Tropical Shallow Soils. *The 24th CAS Conference, University of Guam.* March 10-11, 2003. Abstract & Presentation.

Brown, R.W. and P. Singh (2003). Guam Agricultural Climatic Data System Annual Report Year 1999. *The 24th CAS Conference, University of Guam.* March 10-11, 2003. (Abstr).

Singh, P. and Brown, R.W., 2002. Effects of In-situ Soil Moisture Sensor Location Configuration on Microirrigation Schedules of Head Cabbage. The 23rd CAS Conference, April 2002. Abstract & Presentation.

Singh, P., 2001. Microirrigation Scheduling for Head Cabbage Production. IA Technical Conference. November 4-6, 2001, San Antonio, Texas. Abstract & Presentation.

Brown, R.W. and Singh, P., 2001. Automated Leachate Measurement System for Agricultural Crops in Guam's Shallow Soils. 10th Pacific Inter-Congress Conference, June 2, 2001. Abstract & Presentation.

Singh, P. and Brown, R.W., 2001. Effects of Five Microirrigation Schedules on Head Cabbage Yield and Deep Seepage under Tropical Soil and Environmental Conditions. 10th Pacific Inter-Congress Conference, June 2, 2001. Abstract & Presentation.

Brown, R.W. and Singh, P., 2001. Calibration of RainWise Tipping Bucket Rain gauge for use in Lysimeter Leachate Collection. The 22nd CAS Conference, April 16-17, 2001. Abstract & Presentation.

Singh, P. and R.W. Brown. 2000. Automated Drainage Lysimeter for Environmental Impact Studies in Agriculture. The 21st CAS Conference, April 26-27, 2000. Abstract & Presentation.

Singh, P., A. Benavente, and R. W. Brown. 1999. Development of Research Tools: An automated flow measurement system for microirrigation. The 20th CAS Conference, Univ. of Guam, April 26-27, 1999. Abstract & Presentation.

Brown, R. W. and P. Singh. 1999. Development of Research Tools: Automated evaporation/evapo-transpiraion measuring. The 20th CAS Conference, Univ. of Guam, April 26-27, 1999. Abstract & Presentation.

Singh, P. 1997. Dynamics of Root Growth, Water Uptake and Automation of Micro-Irrigation Scheduling. Tropical and Subtropical Agricultural Research , Section 406 project -Termination report.

Projects/Proposals Submitted:

Singh, P. and Muniappan, R. 2001. GIS Mapping of Invasive plant species of Micronesia. TSTAR Proposal submitted.

Singh, P. & Cruz, F.J. 2000. Environmentally Sensitive Resource Management for Tropical Agroecosystems of Mariana Islands. Proposal submitted to NRCS.

Co-Principal Investigator - USGS Regional Grant: "Development and monitoring of Best Agricultural Management Practices to minimize nitrate pollution in a shallow, calcareous soil." 1996-97.

CURICULUM VITAE

Maika Vuki, PhD

Address: Department of Chemistry
College of Natural and Applied Science
University of Guam
Mangilao, Guam 96923
Email: mvuki@uguam.uog.edu
Telephone: 671-7352784
Fax: 671-7341299

Current position: Associate Professor Chemistry

Institution: University of Guam

EDUCATIONAL QUALIFICATIONS

PhD (Chemistry) University of Southampton, United Kingdom, **1994**
Thesis: "A Study of the Electrochemical Oxidation and Reduction of Polyaniline".

MSc (Chemistry) University of Auckland, Auckland, New Zealand, **1986**
Thesis: "Rates of Dissolution of Hydrous Iron (III) Oxide by Complexing Agents".

BSc (Chemistry & Mathematics) University of the South Pacific, Suva, Fiji, **1983**

AWARDS

1981	First year undergraduate book prize for best undergraduate science student. University of the South Pacific, Suva, Fiji
1983	ICI Gold Medal in Science (Best Science Graduate) University of the South Pacific, Suva, Fiji
1990	British Council Scholar United Kingdom
1994	Certificate of Appreciation for academic excellence, Fiji.

Work History

University of Guam: **Associate Professor Chemistry 2002 - present**

Taught undergraduate courses in Chemistry; Develop new courses and revise old courses.
Develop research projects and write research proposals, conduct research, train research students, manage research budget, write report and publications, deliver seminar

University of the South Pacific: **Lecturer/Senior Lecturer 1990 - 2002**

Taught courses in undergraduate and postgraduate levels in chemistry. Develop new courses and revise old courses.

Develop research projects in environmental chemistry. Write research proposal, execute and manage multidisplinary research projects. Supervise postgraduate students.

University of the South Pacific: **Demonstrator, 1987 - 1990**

Laboratory supervision, preparation, grading for undergraduate chemistry courses, Run test for laboratory experiments.

Fiji Government: **High School Teacher, 1986**

Taught Math and Basic Science at secondary school

PROFESSIONAL EXPERIENCE

Undergraduate and Graduate Teaching: General Chemistry, Physical Chemistry, Analytical Chemistry, Instrumental Methods for Analysis, Environmental Chemistry. Task involve course development, writing lecture materials, develop laboratory experiments, present lectures, supervise laboratories, conduct regular assessment, counsel students.

Develop courses and teach at undergraduate and graduate levels in General, Physical and Analytical chemistry. Supervise undergraduate and graduate research. Lead multidisciplinary research team for environmental monitoring. Planning and execution of research projects; Managing research project budgets; Writing reports; Publishing scientific papers; Oral and Poster presentation, Self motivated, Reliable, Energetic

Research: Chemical behavior of toxic substances in the environment, development of analytical methods for trace analysis, monitoring pollutant levels in the environment. Task involve writing grant proposal for funding, coordinate multi-disciplinary team of scientist to study chemical and biological impact of pollution, supervise the implementation of grant, supervise graduates and research assistants, present papers in international meetings, write scientific papers.

Develop and write research proposals, execute and manage research projects, manage research budget, collect field data, develop analytical methodology, operate and trouble shoot analytical instrumentations.

Computer Software skills: Microsoft Office: Well versed with Word, Excel, and PowerPoint; Quatro pro, Sigma plot.

Research Projects

University of Guam, USA (September 2002 – present).

Conducted Water quality Research on Guam waters funded by USGS through Water and Environment Research Institute. Project titles: Arsenic Speciation Study in Guam Waters. Anthropogenic impact on nitrogen cycle using stable isotope analysis.

Write research grant application for NIH and USDA grant program, Guam Coastal Zone Management Program. Supervise Research assistant for the projects, write technical report and scientific papers, present scientific papers at national and international conference.
Electrochemical studies of gunshot residues; Development of Nanoparticle based sensors

Courses Taught at UOG
CH100/CH100L: Introduction to Inorganic Chemistry/Lab
CH101/CH101L: Introduction to Organic Chemistry/Lab
CH102/CH102L: General Chemistry I/Lab
CH103/CH103L: General Chemistry II/Lab
CH 330/CH330: Quantitative Analysis/Lab
CH410/CH410L: Instrument Methods of Analysis
CH491: Seminar
CH310a-b: Organic Chemistry
CH311/CH312: Basic Laboratory Techniques in Organic Chemistry/laboratory Techniques in Organic Chemistry Lab
CH450a-b: Physical Chemistry
CH451: Physical Chemistry Laboratory I

University of the South Pacific (1987-2002) Design and execute research projects in the following topics: Trace Metals in Fiji Foods, Heavy Metal Pollution on Rewa River, Trace Metal Speciation in Suva Lagoon, Nutrients and Trace Metals in Deep seawater, Fiji. Pesticide Residue Analysis in Vegetable Food Crops, Fiji, Stripping voltaminetric methods for speciation of arsenic in water and environmental samples, Nutrients and metal in Astrolabe Reef Lagoon, Chemistry of wet and dry precipitation in Fiji, Effect of pH and Redox potential on metals in river sediments.

Collaboration Research with Universities.
Research Scholar: Nanjing University, China (**2011**)
Research scholar: University of California, San Diego (**2010**)
Research Scholar: Department of Cell and Molecular Biology, John Burns Medical School, University of Hawaii, Manoa, Hawaii, **2005**
Research Associate: University of California Santa Cruz: Analysis of water under Inductively Coupled Plasma - mass spectrometry (ICP-MS) **2003**
Visiting Research scholar: New Mexico State University: Research on Stripping voltammetry analysis for inorganic and organic pollutants, **1998 – 2001**

Master's Thesis Supervision

1. **Upma Dutt**, Wet and Dry Precipitation Chemistry in Fiji, 2001, University of the South Pacific.

2. **Randhir Deo**, Investigation of the Levels of Heavy Metals in water, sediments and ***kai*** (*Batissa violacea*) in Rewa River, Fiji, 2000, University of the South Pacific.

3. **Emma Mario**. To investigate the Combined Effect of Eh and pH on the Levels of Heavy Metals and Nutrients in the Sediment and Water of the Nausori Sewage Treatment Plant. 2001.

4. **Tasleem Hasan**. Cathodic stripping voltammetric determination of arsenic. Chromium and copper in environmental samples. 2003

PUBLICATIONS

REFEREED JOURNALS

1. **Maika Vuki**, Kwok-Keung Shiu, Michal Galik, Aoife M O'Mahony, Joseph Wang, *Simultaneous electrochemical measurement of metal and organic propellant constituents of gunshot residues*, **The Analyst**. 137(14):3265-70. **2012.**
2. Zhonghui Li, Ming Yan, Zhoumin Li, **Maika Vuki**, Dan Wu, Fei Liu, Wenying Zhong, Luyong Zhang, Danke Xu*A multiplexed screening method for agonists and antagonists of the estrogen receptor protein*. **Analytical and Bioanalytical chemistry**. 403(5):1373-84. **2012.**
3. Xia Wei, Hui Li, Zhonghui Li, **Maika Vuki**, Yu Fan, Wenying Zhong, Danke Xu, *Metal-enhanced fluorescent probes based on silver nanoparticles and its application in IgE detection*, **Analytical and Bioanalytical chemistry**. 402(3):1057-63. **2011.**
4. Hui Li, Weibing Qiang, **Maika Vuki**, Danke Xu, Hong-Yuan Chen*Fluorescence enhancement of silver nanoparticle hybrid probes and ultrasensitive detection of IgE*, **Analytical chemistry**. 83(23):8945-52. **2011.**
5. Ying Wang, Zhonghui Li, Hui Li, **Maika Vuki**, Danke Xu, Hong-Yuan Chen *A novel aptasensor based on silver nanoparticle enhanced fluorescence*. Biosensors & **Bioelectronics,** 32(1):76-81. 2011.
6. Qing Chen, Zhoumin Li, Xirui Zhao, Xiabou Yu, **Maika Vuki**, Wei He, and Danke Xu A highly-sensitive colorometric assay method for antibody array based on Tyramide amplification system. **Analytical Letters**. 45: 2-3, 219-226; **2012.**
7. Maika Vuki, John Limtiaco, Tovahl Aube, Jacquiline Emmanuel, Gary Denton, Rick Wood, Arsenic Speciation Study in some spring waters of Guam. **Science of the Total Environment,** 379. 176-179. **2007.**
8. Wang J., Lu J., Ly S.Y., Vuki M., Tian B., Adeniyi W.K., Amendariz R.A., Lab on a cable: Lab-on-cable for electrochemical monitoring on phenolic contaminants. **Analytical Chemistry**. 72(11) 2659 – 2663. **2000.**
9. Wang J., Karyakin A., Vuki M., Karyakina E., Orlov A. Karpachova G., Lukachova L., Processible Polyaniline as an Advanced Potentiometric pH Transducer. Application to Biosensors. **Analytical Chemistry**. 71. 2534 – 2540. **1999**.

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4.10. Wang J., Czae M., and Lu J., Vuki M., Catalytic-Adsorptive Stripping Voltammetric Measurements of Picomolar Levels of Platinum in the Presence of Hydrylamine: How Low can We Go? **Microchemical Journal**, 62, 121-127, **1999**.

5.**11. M. Vuki**, M. Kalaji, L. Nyholm and L. M. Peter, Redox Switching of Polyaniline Film, **Synthetic Metals**, 55, 1515, **1993**

6.**12. M. Vuki**, M. Kalaji, L. Nyholm and L. M. Peter, An ultramicroelectrode study of low temperature Redox switching of Polyaniline, **Journal of Electroanalytical Chemistry**, 332, 315, **1992**.

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PEER REVIEWED PAPERS AND CONFERENCE PROCEEDINGS

1. **M. Vuki** and L. Peter (1998) Investigation of the Relaxation Effect in Polyaniline, Proceedings of the 10th Australasian Electrochemistry Conference, Australia.

2. **M. Vuki**, L. Peter, M Kalaji and L. Nyholm, (1992) Redox Switching of Polyaniline Films: Low Temperature Studies, International Conference on Science and Technology of Synthetic Metals, Goteborg, Sweden.

Reviewer of Scientific Papers and Thesis

1. "Swipe and Scan": Integration of sampling and analysis of gunshot metal residues at screen-printed electrodes, by Aoife M. O'Mahony, Joshua R. Windmiller, Izabela A. Samek, Amay Jairaj Bandodkar, Joseph Wang, Department of Nanoengineering, University of California, San Diego, La Jolla, CA 92093, USA. Chemical Communication, 2012, 23, 52-55.

2. **Nutrient Pollution in Laucala Bay, Fiji Islands** by Sarabjeet Singh, W.G.L Aalbersberg, and R.J. Morrison, 2009; published in Water, Air, and Soil Pollution, 2009.

3. PhD thesis by Neetu Bansal Title: **Mechanistic Studies of Ligand Substitution Reactions on Hexacyanoferrate(II) and their Applications as Analytical Tool**, 2010, University of the South Pacific, Fiji

4. MSc Thesis by Curtis Gregory Title: **An Investigation of the Possible Influence of Microorganism on the uptake of Trace Metals by Ulva Lactuca, University of Wollongong, Australia**, 2008.

BOOK CHAPTERS

1. Wei Song, Si Wei, Hong-Xia Yu, **Maika Vuki**, Danke Xu, Biosensor Arrays for Environmental Monitoring, **In Tech**, ISBN: 978-953-307-724-6, 2011.

1.2. V.C. Vuki, I.P. Zann, M. Naqasima, and **M. Vuki**, Fiji Islands, In the Sea at the Millenium, (2001) Edited by Charles Sheppard, Elsevier Press, Netherlands.

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~~2.~~3. **M. Vuki** and W. Aalbersberg, (1996) Form 7 Chemistry Study Guide. Atomic Structure, Bonding and the Periodic Table, Chemical Society of the South Pacific, Edited by Maika Vuki and William Aalbersberg. Formatted: Bullets and Numbering

~~3.~~4. **M. Vuki** and P. Gangaiya, (1996) Form 7 Chemistry Study Guide. Oxidation - Reduction, Chemical Society of the South Pacific, Edited by Maika Vuki and William Aalbersberg. Formatted: Bullets and Numbering

TECHNICAL REPORTS

1. **M. Vuki**, R. Morrison, M. Maata, W. Aalbersberg, K. Koshy, S. Naidu, V. Fuavao, W. Dixon, and W. Peter, (1992) Water Quality, Fiji's Great Astrolabe Reef and Lagoon: A Baseline Study, Environmental Studies Report, no. 56, Institute of Applied Sciences, University of the South Pacific.

2. **M. Vuki**, (1991) Electrochemical Behaviour of Polyaniline Films at Low Temperature, Chemistry Department, University of Southampton, United Kingdom.

ABSTRACTS

1. **M. Vuki,** J. Limtiaco, T. Aube, R. Woods, and G. Denton, Arsenic Studies in Guam Waters, 8th International conference of biogeochemistry of trace elements, 2005, Adelaide, Australia
2. V. Vuki, **M. Vuki**, and L. Kumar (1998) The Impact of Sand Mining on Suva's Reef, Fiji. Second International Conference of Marine Pollution and Ecotoxicology 10th - 14th June, 1998, Hong Kong.

3. **M. Vuki** and L. Peter (1998) Investigation of the Relaxation Effect in Polyaniline, Proceedings of the 10th Australasian Electrochemistry Conference, Australia.

4. **M. Vuki**, W. Aalbersberg, and K. Koshy (1997) Determination of the Level of Trace Metals in Fiji Foods, 8th Pacific Science Inter-congress, USP, July 1997.

5. **M. Vuki**, K. Koshy, and U. Dutt (1997) Wet and Dry Precipitation Chemistry in Fiji, 8th Pacific Science Inter-congress, USP, July 1997.

6. **M. Vuki**, L. Peter, M Kalaji and L. Nyholm, (1992) Redox Switching of Polyaniline Films: Low Temperature Studies, International Conference on Science and Technology of Synthetic Metals, Goteborg, Sweden. August 1992.

TEACHING NOTES AND MANUALS

1. **M. Vuki** (1996) Hints for Teachers, Edited, by Roger Landbeck, Jay Handel, and Francis Mugler 1996.

2. **M. Vuki**, K. Koshy, J. Khurma, and I. Ahmed, CH 101 Chemical Principles: Lecture Notes, Chemistry Department, 1997.

3. **M. Vuki**, K. Koshy, J. Khurma, and I. Ahmed, CH 101 Chemical Principles: Lecture Notes, Chemistry Department, 1999 (revised edition).

4. **M. Vuki** and J. Khurma, CH 203 Notes, Chemistry Department, 1997.

5. **M. Vuki** and J. Khurma, CH 203 Notes, Chemistry Department, 1999 (revised).

6. **M. Vuki**, CH 101 Laboratory Manual, Chemistry Department, 1995, 1996, and 1997 editions.

PAPERS DELIVERED AT INTERNATIONAL MEETINGS AND UNIVERSITIES

1. Microwave digestion method for trace metal analysis, South Pacific Regional Chemistry Symposium, 2002, University of the South Pacific, Fiji.

2. Heavy Metal Pollution in Rewa River, Fiji, Pacific Science Congress, 2001, University of Guam, Guam.

3. **M. Vuki**, (1998) Conducting Polymers for Bio-analytical Applications, Graduate Seminar, New Mexico State University, USA, 1998.

4. **M. Vuki** (1998) Investigation of the Relaxation Effect in Polyaniline, 10th Australasian Electrochemistry Conference, Australia, February 1997.

5. **M. Vuki**, W. Aalbersberg (1997) Food Toxicity Studies at USP, Food Safety and Food Control Workshop, 1997, Western Samoa.

6. **M. Vuki**, (1992) Redox Switching of Polyaniline Film, International Conference of Science and Technology for Synthetic Metals, Sweden.

Leadership and Administrative Experience

Chair for Division of Natural Science Academic Affairs Committee (2007 – 2010)
Chemistry Program Coordinator (2007-2010;2011-present):
Member of University of Guam Assessment Committee (2008 – 2010, 2011-present)
Member of the University of Guam Education Effectiveness Committee (2007-2008)
National Institute of Health RISE Program Mentor 2004-2005, University of Guam.
Board member of the St. Thomas Aquinas Catholic High School, Guam (2008-2009)
Search Committee for University of Guam Assessment Coordinator (2008)
Member of the University of Guam Transition Team on restructure of the university, Co-chair of Transition team on Graduate School/Research/Sponsored Program, UOG: 2004

Assistant Head of School, SPAS, 2002 for Postgraduate Affairs
Acting Head of School, Acting Head of Chemistry: Acting to these positions under various occasions while at USP.
President of the Chemical Society of the South Pacific (2001-2002): The society that promotes and advances the knowledge in chemistry in schools and communities in the South Pacific, USP
Fijian Affairs Board Subcommittee on Monitoring and Mentoring (2001-2002)
Coordinator of Foundation Science Program, USP
Degree II and III Advisor for Science, USP
Chairman of Pacific Students for Christ: An Inter-tertiary Pacific Regional Christian Organization that oversees the function of Christian Fellowship groups on different campuses in Fiji and the South Pacific Region, Fiji. (1999-2001)

MEMBERSHIP OF PROFESSIONAL ORGANIZATIONS

1. Member of American Chemical Society, 2004
2. Member of the Chemical Society of the South Pacific, 2000-2002
3. Member of the Marine Pollution Group 1989 - 1990.

WORKSHOPS

- Represented the College of Natural and Applied Science at the Western Association on Schools and Colleges at the seminar on The Science of Learning, Pomona California, USA, 2007
- Participated in the Molecular Genetics and Protein Structure and Function Workshop, Center for Workshop in Chemical Sciences, National Science Foundation, University of Hawaii, Hilo, 2004
- Participated in the Process and Analytical Chemistry Workshop, Center for Workshop for Chemical Sciences, National Science Foundation, Baton Rouge, Louisiana, 2003.
- Member for the Organizing Committee for the first Regional Chemistry Symposium, University of the South Pacific, Fiji, 2002
- Member of the organizing committee for Form 7 Chemistry Teachers Workshop, 1995.
- Participated in Workshop on Contaminants in Soil and Water Environments at the 8th Pacific Science Inter-congress, 1997.
- Presented a paper at the FAO workshop on Food Safety and Food Control, Western Samoa, 1997.
- Participated in CELT workshop on small group tutorials with the aim of improving the quality of tutorial for CH 101 course, 1997.
- Participate in Workshop on Fiber Optics as sensors, 1996. Chemistry Department.

VITA OF JIAN YANG

Mailing Address

Western Pacific Tropical Research Center
College of Natural and Applied Sciences
University of Guam, UOG Station
Mangilao, Guam 96923

Tel: (671) 735-2027
Fax: (671) 734-4222
Email: jyang@uguam.uog.edu

Education

Ph.D. 2001 – Food Science, Washington State University, Pullman, WA.
M.S. 1997 – Food Science, Washington State University, Pullman, WA.
B.E. 1985 – Food Technology, Southern Yangtze University, Wuxi, P.R. China.

Employment History

February, 2002 – present University of Guam Mangilao, Guam
Professor/Extension Specialist (3013 – present), Associate Professor/Extension Agent IV (2007 – 2013), Assistant Professor/Extension Agent III (2002 – 2007), Food Science, Cooperative Extension Service; Extension and research in food safety, food processing, and biological properties of tropical crops; Teaching Food Safety and Sanitation, Food Chemistry, and special project courses.

August, 1994 – December, 2001 Washington State University Pullman, WA
Graduate Research Assistant, Department of Food Science and Human Nutrition
Research for USDA funded projects in protein modification and functionality, and sensory quality of potatoes affected by natural sprout inhibitors

February, 1990 – January, 1991 Carl Duisberg Gesellshaft Germany
Visiting Scientist, University, Colleges, and Industries in Germany
In the Academic and Industry Leadership Program in Food Science and Nutrition

August, 1985 – July, 1994 Zhejiang College of Light Industry Hangzhou, P.R. China
Faculty Member, Food Technology Unit
Teaching the courses in food science and technology including food processing & preservation, dairy, cereal, beverage, meat, vegetable, and fruit processing;
Research in food processing and product development.

Society Affiliation

Professional member of the Institute of Food Technologists (IFT) (1994 – present)
Member of Advancing Science Service Society (AAAS) (2011-present)
Member of North American Jiangnan University Association (NAJUA) (2006 – present)
Member of the Chinese American Food Society (CAFS) (1998 – present)
Member of the Phi Tau Sigma Honorary Society for Food Science (1999)

Refereed Journal Publications

Yang, J, Lee, D, Afaisen, S, Gadi, R. 2013. Inactivation by lemon juice of *Escherichia coli* O157:H7, *Salmonella* Enteritidis, and *Listeria monocytogenes* in beef marinating for the ethnic food kelaguen. International Journal of Food Microbiology. 160: 353-359.

Marler, T and **Yang, J.** 2013. Risk of aluminum exposure from noni (*Morinda citrifolia* L.) leaf products. Economic Botany. 67:203-209.

Yang, J and Gadi, R. 2011. Antioxidant capacity, total phenols, and ascorbic acid of noni fruits and leaves at various stages of maturity. Micronesica. 41:167-176.

Yang, J, Gadi, R, Paulino, R, Thomson, T. 2010. Total phenolics, ascorbic Acid, and antioxidant capacity of noni (*Morinda citrifolia L.*) juice and powder as affected by illumination during storage. Food Chemistry. 122: 627-632.

Yang, J and Lee, D. 2009. Lemon, pH and citric acid for kelaguen without temperature control for safety. Micronesica. 41: 21-33.

Yang, J. and Gadi, R.L. 2008. Effects of steaming and dehydration on anthocyanins, antioxidant activity, total phenols and color characteristics of purple-fleshed sweet potatoes (*Ipomoea batatas*). American Journal of Food Technology. 3: 224-234.

Yang, J, Paulino, R, Janke-Stedronsky, S, Abawi, F. 2007. Free-radical-scavenging activity and total phenols of noni (*Morinda citrifolia* L.) juice and powder in processing and storage. Food Chemistry. 102: 302-308.

Yang, J, Powers, JR, Clark, K, Dunker, AK, Swanson, B.G. 2003. Lignd and flavor binding functional properties of β-lactoglobulin in molten globule state induced by high pressure. Journal of Food Science. 68: 444-452.

Yang, J, Powers, JR, Clark, K, Dunker, AK, Swanson, B.G. 2002. Hydrophobic probe binding of β-lactoglobulin in the native and molten globule state induced by high pressure as affected by pH, NaCl, KIO_3 and E-ethylmaleimide. Journal of Agriculature and Food Chemistry. 50: 5207-5214.

Yang, J, Dunker, AK, Powers, JR, Clark., K, Swanson, B.G. 2001. β-Lactoglobulin molten globule induced by high pressure. Journal of Agriculture and Food Chemistry. 49: 3236-3243.

Boylston, TD, Powers, JR, Weller, KM, **Yang, J**. 2000. Comparision of sensory difference of stored *Russet Burbank* potatoes treated with CIPC and alternative sprout inhibitors. Amer. J. Potato Res. 78: 99-107.

Yang, J, Powers, JR, Boylston, TD, Weller, K. 1999. Sugars and free amino acids in stored potatoes treated with natural sprout inhibitors. J. Food Sci. 64: 592-596.

Grants Received

2010-2013. *Project Director*. USDA-NIFA Tropical and Subtropical Agricultural Research (T-STAR). Identifying marker compounds and indicators in noni (*Morinda citrifolia*) products for enhancing shelf-life and quality control. $160,338.

2005-2008. *Co-Principal Investigator*. USDA-CSREES Tropical and Subtropical Agricultural Research (T-STAR). Adding value to tropical and subtropical botanicals: identification and valuation of bioactivity polyphenols in Ilex, Guava, Mamaki, and Noni Leaf Teas. $150,000.

2005-2006. *Project Director*. USDA-CSREES National Research Competitive Grants Program (NRICGP). UV/Visible fluorescence microplate reader for strengthening research capacities in food science at the University of Guam. $24,950.

2004-2009. *Project Director*. USDA-CSREES Integrated Research, Education, and Extension Competitive Grants Program: the National Integrated Food Safety Initiative (NIFSI). Food safety education and traditional food 'Kelaguen' modification for consumers and children in the U.S. Territory of Guam. $386,701.

2003-2008. *Projector Director*. USDA-CSREES Multicultural Higher Education Program (MSGP). Career opportunity for pacific islanders in general food and agricultural sciences. $100,000 (Received).

2003-2007. *Projector Director*. USDA- CSREES Tropical and Subtropical Agricultural Research (T-STAR). Program. Bioavailability of biological components in Noni (*Morinda citrifolia*) products as affected by processing and storage. $164,000.

2003 – 2006. *Projector Director*. USDA-CSREES Integrated Research, Education, and Extension Competitive Grants Program: the National Integrated Food Safety Initiative (NIFSI). Food safety education & training for consumers and food establishments in the U.S. Territory of Guam. $89,958.

2003-2005. *Projector Director*. USDA-CSREES National Research Competitive Grants Program (NRICGP). Potential application of anthocyanins from purple sweet potato cultivars originated from the Western Pacific Islands. $75,000.

2003-2004. *Projector Director*. The Department of Defense (DoD) Infrastructure Support Program for Historically Black Colleges/Universities and Minority Institutions (HBCU/MI). Instrumentation for enhancing the discipline of food and agricultural sciences at the University of Guam $176,068.

2000-2003. Co-*Principal Investigator*. USDA-CSREES National Research Competitive Grants Program (NRICGP). Surface hydrophobicity and functionality of proteins in the molten globule state. $187,800.

Community Extension and Regional Publications

Yang, J. 2012. Most foodborne illness comes from homes. Pacific Daily News. Opinion. Sep. 19.

Yang, J. 2011. Making fresh noni (Lada) juice at home (Brochure). Cooperative Extension Service, University of Guam.

Yang, J. 2010. Noni juice: a new way to prep the healthy, local staple. Pacific Daily News, Lifestyle, June 17.

Yang, J. 2009. Safe kelaguen preparation and serving (Brochure). Cooperative Extension Service, University of Guam.

Yang, J. 2008. Handle Easter eggs safely, avoid illness. Pacific Daily News, Lifestyle, March 22.

Yang, J. 2008. Safe kelaguen preparation (Video). Cooperative Extension Service, University of Guam.

Yang, J. 2007. Avert foodborne illness, practice proper hygiene. Pacific Daily News. Lifestyle, Dec. 30.

Yang J. 2007 Ester Egg Safety (Fact sheet). Guam Cooperative Extension Service. University of Guam.

Yang J. 2007. How to sanitize dishes, utensils and cutting board (Fact sheet). Guam Cooperative Extension Service. University of Guam.

Yang, J. 2007. Food safety during and after typhoon (Brochure). Cooperative Extension Service. University of Guam.

Yang, J. 2006. Key food handling behaviors to prevent foodborne illness (Brochure). Cooperative Extension Service, University of Guam.

Yang, J. 2006. Safe turkey meal preparation in Thanksgiving (Fact sheet). Guam Cooperative Extension Service. University of Guam.

Yang, J. 2003. What should I know about foodborne pathogens? Pacific Daily News. Lifestyle, Jan 3: 43, 45.

Yang, J. 2002. Food safety guideline during disaster recovery. Pacific Daily News. Lifestyle, Dec 20: 30, 32.

Yang, J. 2002. Safe turkey relies on time and degree. Pacific Daily News. Lifestyle, Nov 24: 20.

Appendix 5: New Course Requests/ Syllabi

Log # 5277 c

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Advanced Food Safety
2. Catalog Number: AL 542 (New course may not duplicate active or inactive course number.)
3. Course Type: [X] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,…94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X] Graduate (/G) [ ] Both
5. Credit Hours: 3
6. Is this course cross-listed with another department? No
   If so, list the cross-listed catalog number (s)? ____
7. What session(s) will the course be offered? [X] Fall [ ] Spring [ ] Summer [ ] All
8. What will be the yearly cycle for this course?
   [ ] All Years [X] Even Years [ ] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SP 2017 Length of Instruction (Weeks): 15
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B. Prerequisites Catalog # Prerequisite Course Title

Prerequisites Catalog #	Prerequisite Course Title
BI 157-157L & BI 158-158L	Principles of Biology I & II
BI 124-124L & BI 125-125L	Human Anatomy and Physiology I & II
BI 110-110L & BI 225-225L	Human Biology; Basic Microbiology
CF 342	Food Safety and Sanitation

    C. Additional Prerequisites: ____

Log # 5277 c

11. CATALOG DESCRIPTION: Use complete sentences and present tense.

This course covers biological, chemical, and physical agents of foodborne diseases and provides a farm-to-fork perspective overview of food safety, including the fundamental principles, laboratory and analytical methods, risk assessment and hazard analysis, safe operations and technology, and food safety topics, issues, and regulations.

12. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

Online Journal available: Journal of Food Protection, Journal of Food and Nutrition Research, Journal of Food Science and Technology. Journal available in the CALS/CFS office: Journal of Food Science, Journal of Food Technology

13. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE

To meet the requirement of the new CNAS Master's Program: Agricultural and Food Biosecurity (Track 4).

14. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PRJECTED SIZE.

The anticipated class size will be 4-20.

15. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

CNAS faculty in food science and agricultural sciences

16. ADDITIONAL INFORMATION:

None

17. ATTACH COURSE OUTLINE:

See attached file

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		
Administrative Chair		4-05-2013
Chair, College AAC/CC		5/13/13
Dean, of College		4/16/13
UCRC/GCRC		
President, Faculty Senate (if substantive)	(Endorsement of UCRC/GCRC Recommendation)	

APPROVED:

SENIOR VICE PRESIDENT
ACADEMIC & STUDENT AFFAIRS

DATE

Revised: SVP 082710 jsn – Request for New Course Form-

Page 2 of 2

Log # 5277 c

UNIVERSITY OF GUAM
COURSE OUTLINE

College: College of Natural and Applied Sciences

Course Number: ~~CF 500~~ AL 542

Course Title: Advanced Food Safety

Credit Hours: 3

Date of Final Approval: _____

Semester Offered: Spring Odd Years

Course counts as:

_____ general education requirement
X part of Consumer & Family Sciences major program
X elective

1. Catalog Description:

This course covers foodborne illness and pathogen prevalence, characterization of food hazards; risk assessment and prevention; systems of food safety surveillance; food safety operation; diet, health and food safety; problems, controversies, and solutions; world-wide food safety issues; and food safety regulations. Prerequisites: BI157-157L and BI158-158L, or BI124/124L and BI125-125L, or BI110/110L, CH101with grade of C or better; or BI225/225L, or CF342.

2. Course Content:

- Definition of food safety and characterization of food hazards
- Foodborne illness and pathogen prevalence
- Biological hazards
- Chemical and physical hazards
- Systems of food safety surveillance
- Risk analysis and risk prevention
- Food Safety Operations
- Diet, health, and food safety
- Food safety problems, controversies, and solution
- World-wide food safety issues
- Food safety regulation

3. Rationale for the Course:

This course is designed to provide the student with an advanced understanding of the concepts of food safety including food hazards, food safety surveillance, risk assessment and prevention, food safety operations, emerging food safety topics in diet and health, food safety controversies and solutions, world-wide food safety issues, and food regulations. This course extends the concepts introduced in CF 342 Food Safety and Sanitation.

4. Skills and Background Required or Expected:

Prerequisites for CF 500 are: BI157-157L and BI158-158L, or BI124/124L and BI125-125L, or BI110/110L, CH101with grade of C or better; or BI225/225L, or CF342 with grade of C or better; or consent of instructor. The material will be taught with the understanding that students have a good grasp of fundamental principles of microbiology, organic chemistry, and nutrition & food science.

5. Teaching Methodologies and Anticipated class size:

Class size is 20. This course will include individual, group and cooperative learning methods. Classes will consist of lectures, group discussions, outside readings, written assignments, term paper, and oral presentations.

JtD Updated April 1, 2008

Log # 5277 c

6. Learning Objectives for Students:

As a result of taking this course, the learner should be able to:

- Define food safety and foodborne illness
- Characterize biological, chemical, and physical hazards
- Comprehend the prevalence of foodborne pathogens
- Explain the systems of food safety surveillance
- Comprehend risk analysis and prevention
- Determine functions of food safety operations
- Discuss and explain the issues and associations among diet, health, and food safety
- Discuss and explain the controversies and solutions of emerging food safety topics
- Comprehend food safety regulations
- Identify and discuss world-wide food safety issues

7. Methods of Evaluation

Methods of evaluation consist of written tests and assignments. These components are weighted as follows: exams, 50%; assignments, 30%; and term paper 20%

8. Methods for Student Learning Outcomes Assessment:

Depending on Instructor and Program Faculty, any one or more of the following may be selected: Pre- and post-test; Course embedded questions; Standardized exams; Portfolio evaluation; and Direct observation.

9. Required and Recommended Texts or Study Guides:

Redman: Food Safety (Contemporary World Issues), 2nd ed., ABC-LCIO, 2007. (ISBN: 978-1598840483)

Fortin: Food Regulation: Law, Science, Policy, and Practice, 1st ed., Wiley, 2009. (ISBN: 978-0470127094)

Schmidt and Rodrick: Food Safety Handbook, Wiley, 1st ed., 2002. (ISBN: 978-0471210641)

10. Subsequent Courses:

None

11. Additional Course Descriptors, if any:

None.

_____Approved _____Disapproved

_____
Senior Vice President, Academic & Student Affairs

_____
Date

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

JtD Updated April 1, 2008

Log # 5277 c

UNIVERSITY OF GUAM

College of Natural & Applied Sciences

AL 542 ~~CF 500~~ ADVANCED Food Safety

COURSE SYLLABUS

INSTRUCTOR

Jian Yang, Ph.D., Associate Professor of Food Science
Office: Agriculture Bldg, Room 113B
Phone: 735-2027
E-mail: jyany@uguam.uog.edu
Office Hours:

CATALOG DESCRIPTION

This course covers foodborne illness and pathogen prevalence, characterization of food hazards; risk assessment and prevention; systems of food safety surveillance; food safety operation; diet, health and food safety; problems, controversies, and solutions; world-wide food safety issues; and food safety regulations. Prerequisites: BI157-157L and BI158-158L, or BI124/124L and BI125-125L, or BI110/110L, CH101with grade of C or better; or BI225/225L, or CF342.

RATIONALE FOR THE COURSE

This course is designed to provide the student with an advanced understanding of the concepts of food safety including food hazards, food safety surveillance, risk assessment and prevention, food safety operations, emerging food safety topics in diet and health, food safety controversies and solutions, world-wide food safety issues, and food regulations. This course extends the concepts introduced in CF 342 Food Safety and Sanitation.

COURSE FORMAT

Instructor relies heavily on lecture method to deliver information. However, the instructor will incorporate class discussions, group case studies, term paper, and other forms of active participation whenever possible.

REQUIRED TEXTBOOK

Redman, Food Safety: Contemporary World Issues, 2nd ed., ABC-LCIO, 2007. (ISBN: 978-1598840483)

LEARNING OBJECTIVES

As a result of taking this course the learner should be able to:

- Define food safety and foodborne illness
- Characterize biological, chemical, and physical hazards
- Comprehend the prevalence of foodborne pathogens
- Explain the systems of food safety surveillance
- Comprehend risk analysis and prevention
- Determine functions of food safety operations
- Discuss and explain the issues and associations among diet, health, and food safety
- Discuss and explain the controversies and solutions of emerging food safety topics
- Comprehend food safety regulations
- Identify and discuss world-wide food safety issues

COURSE POLICIES

You are responsible for your learning. Take advantage of the available resources provided for this course, such as books, literatures, activities, and office hours. You are required to attend every lecture period, finish assignments, take quizzes and exams, and complete a term paper. Chronic absences and tardiness will result in a loss of the discretionary points. If something prevents you from attending class, you are still responsible to keep up with your study. Please contact the instructor or a classmate for copies of new handouts.

As a courtesy and avoiding disruption to the instructor and to your classmates, please come to class on time and not leave early. Please don't talk to each other when the instructor is addressing the class or a student is speaking or answering questions. Please turn off all cell phone, MP3 players, or other devices, which may interrupt the class. For an emergency situation, please contact instructor to make a special arrangement before class begins.

All assignments must be submitted on the scheduled dates. Later submission of assignments will not be accepted. No plagiarism and any form of cheating will be allowed in doing assignments, taking quizzes and exams, and writing a term paper. Any evidence of cheating and plagiarism will result in a score of zero for that assigned task or possible a score of "F" for the entire course. Three exams will be given on scheduled dates in this course; no make-up exam will be given. If you miss an exam, the score of the missing exam will be either zero or an average of your score—the determination is based on a valid reason and the instructor's discretion. If you are unable to take the exam, you should notify the instructor in advance.

UOG DISABILITIES POLICY

In accordance with the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973, the University of Guam does not discriminate against students and applicants on the basis of disability in the administration of its educational and other programs. The University offers reasonable accommodations for a student or applicant who is otherwise qualified, if the accommodation is reasonable, effective and will not alter a fundamental aspect of the University's program nor will otherwise impose an undue hardship on the University, and/or there are not equivalent alternatives. Students are expected to make timely requests for accommodations using procedure described at: www.uog.edu/eeo/PolicyDisability.pdf. If appropriate, the University may choose to consult with such individuals, at or outside the University, to provide expertise needed to evaluate the request for accommodation. *Each student bears the responsibility for initiating and then documenting a disability-related request for accommodation in the manner requested in this Policy.*

SPECIAL NEEDS (EEO/ADA)

If you are a student with a special need who will require an accommodation(s) to participate in this course, please contact the instructor privately to discuss your specific needs. You will need to provide me with documentation concerning your needs for accommodation(s) from the EEO/ADA office. If you have not registered with the EEO/ADA office, you should do so immediately at 735-2243/2244/2971 (TTY) to coordinate your accommodation request.

GRADING SYSTEM/EVALUATION METHODOLOGIES:

Summary of Course Requirements	points	%
1. 3 Exams (each exam worth 100 points)	300	50%
2. Assignments/Quizzes	100	17%
3. Term paper	100	17%
4. Term paper presentation	50	8%
5. Discretionary	50	8%
Total	*600*	*100%*

COURSE CALENDAR

Date	Topic	Chapter	Due
01/	Introduction		
01/	Foodborne illness and pathogen prevalence	1	
01/	continued		
01/	Biological hazards	2	
02/	continued		
02/	Chemical and physical hazards	3	
02/	Continued		
02/	Risk analysis and prevention	4	
02/	continued		
02/	continued		
02/	**Exam #1**		
02/	Food safety operation	5	
03/	continued		
03/	continued		
03/	Food safety, diet, and health	6	
03/	No Class —Charter Day		
03/	continued		
03/	continued		
03/	Food safety controversies and solution	7	
03/	continued		
03/	continued		
04/	No Class — Spring Break		
04/	No Class — Spring Break		
04/	**Exam #2**		
04/	World-wide food safety issues	8	
04/	continued		
04/	continued		
04/	Food safety regulation	9	
04/	continued		
05/	continued		
05/	Term paper presentation		
05/	continued		
05/	continued		
05/	**Exam #3**		

This schedule is tentative, and subject to change. Any changes will be announced in class.

WITHDRAWL DATES

You must withdraw at the UOG Records Office before the date of the deadline for 'Voluntary Withdraw'. If you want to withdraw after this date, you must file a 'Petition for Withdraw' by the deadline date. Forms are available at the UOG Admissions and Records Office.

STUDENT WORKLOAD

For every hour of a lecture class, a student needs to spend an average of 2 hours for studying. For a 3 credit hour course, you need to spend 6 hours for studying. I suggest you to structure your 6 hours: 1 hour of pre-reading the textbook before class, 3 hours of re-reading the textbooks or other reference

CONTACT INFORMATION FOR CLASSMATES

Write the names and contact info for two or three classmates you can contact if you miss a session or want to study together. I encourage you to form study groups!

SUGGESTED SUPPLEMENTAL READINGS

Neal D. Fortin: Food Regulation: Law, Science, Policy, and Practice, 1st ed., Wiley, 2009. (ISBN: 978-0470127094)

Ronald H. Schmidt and Gary E. Rodrick: Food Safety Handbook, Wiley, 1st ed., 2002. (ISBN: 978-0471210641)

Faculty Senate Office
University of Guam
Received By: in
11/15/2016 12:20 pm
Date & Time

No. 5277d

UNIVERSITY OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Agroecology for Island Sustainability
2. Catalog Number: AG566 (New course may not duplicate active or inactive course number.)
3. Course Type: [ ] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,…94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X] Graduate (/G) [ ] Both
5. Credit Hours: 3
6. Is this course cross-listed with another department? No
   If so, list the cross-listed catalog number (s)? _____
7. What session(s) will the course be offered? [ ] Fall [X] Spring [ ] Summer [ ] All
8. What will be the yearly cycle for this course?
   [ ] All Years [X] Even Years [ ] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SP 2016 Length of Instruction (Weeks): 16
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B. Prerequisites Catalog # Prerequisite Course Title
       BI100 or Environmental Biology
       AG101 or Introduction to Agriculture
       AG102 Introduction to Plant Science
    C. Additional Prerequisites: or consent of instructor

11. CATALOG DESCRIPTION: Use complete sentences and present tense.

Agroecology is the science of applying ecological concepts and principles to the design and management of sustainable food/agricultural production systems. The lecture topics include comparing structural and functional differences between natural ecosystems and agroecosystems with an emphasis on the tropical islands. The students study the resource–conservation and diversification of plant materials for agricultural sustainability. This course is offered to graduate students who have interested in studying plant, soil and natural resource science, environmental science, agricultural and food bio-security, socio- and human ecology and general biological sciences. This course includes three hours of lecture weekly. Prerequisite: BI100 or AG101 or AG102, or consent of instructor.

12. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

Literature search using PREL, EBISCO (Database: AGRICOLA, MEDLINE, GREEN LINE) through RFK Library on-line search. Additionally supplemental reading materials will be provided by instructor.

13. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE

Understanding sustainable agroecosystems will be essential for greater crop production with a minimal environment effects to natural resources in our society. This course will provide graduate students with the opportunity to learn how to apply ecological concepts and principles to the design and management of sustainable agricultural production. This course is especially relevant on Guam as agricultural industry is limited to confined areas, and that maintaining sound agroecosystems will be a key factor to sustain a food bio-security and sound human life on the island, especially approaching time of military build-up and rapid urbanization on a limited land. There is no course offering similar to this course at UOG.

14. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PRJECTED SIZE.

Anticipated class size is 5-10. The result of a survey conducted during 2009-2010 indicated that 42 responses out of 114 undergraduate students (42%) are interested in the areas of sustainable agriculture and natural sciences in graduate level.

15. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

Faculty in Agriculture and Life Science Division will teach this course.

16. ADDITIONAL INFORMATION: None

17. ATTACH COURSE OUTLINE: See attached.

UNIVERSITY
OF GUAM
Unibetsedât GUAHAN

Office of Academic and Student Affairs

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		
Division Chair		4-5-2013
Chair, College AAC/CC		5/13/13
Dean, of College		2/16/17
UCRC/GCRC		
President, Faculty Senate (if substantive)	(Endorsement of UCRC/GCRC Recommendation)	

APPROVED:

SENIOR VICE PRESIDENT
ACADEMIC & STUDENT AFFAIRS

DATE

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

NEW COURSE OUTLINE FORM

College: College of Natural & Applied Sciences Course Number: AG566

Course Title: Agroecology for Island Sustainability Credit Hours: 3

Date of Final Approval: Semester Offered: Spring 2014

Course counts as:

	general education requirement
X	part of Agriculture and Life Science Graduate Program
X	elective

1. Catalog Description:
Agroecology is the science of applying ecological concepts and principles to the design and management of sustainable food/agricultural production systems. The lecture topics include comparing structural and functional differences between natural ecosystems and agroecosystems with an emphasis on the tropical islands. The students study the resource–conservation and diversification of plant materials for agricultural sustainability. This course is offered to graduate students who have interested in studying plant, soil and natural resource science, environmental science, agricultural and food bio-security, socio- and human ecology and general biological sciences. This course includes three hours of lecture weekly. Prerequisite: introductory science courses or consent of instructor.

2. Course Content:
This course will consist of 3-hour lecture per week. For each lecture, selected topics on agroecology will be presented for discussion and demonstration for students to understand how natural ecological systems can be adapted in sustainable agricultural systems in Guam and other parts of the world. Lecture topics will include the introduction to agroecology, interaction between plants and environmental factors, agroecosystem diversity and management, and transition to sustainable food system. There will be requirements of taking a mid-term exam and final exam. Additionally, group or individual projects will be assigned to provide students opportunities to understand in depth of sustainable agroecological systems. Students will present orally their findings on assigned projects. Submission of a written report on an assigned project will also be required.

3. Rationale for the Course:
Sustainable agroecosystems will be essential for greater crop production with a minimal environment effects to natural resources in our society. This course will provide graduate students with the opportunity to learn how to apply ecological concepts and principles to the design and management of sustainable agricultural production. This course is especially relevant on Guam as agricultural industry is limited to confined areas, and that maintaining sound agroecosystems will be a key factor to sustain a food bio-security and sound human life on the island, especially approaching time of military build-up and rapid urbanization on a limited land. There is no course offering similar to this course at UOG.

4. Skills and Background Required or Expected:
College writing and mathematics, and some knowledge of agriculture, biology, chemistry, environmental science, and natural sciences.

5. Teaching Methodologies and Anticipated class size:
Format of the course is a series of lectures and demonstrations of the main concepts of agroecology. The required textbook will be used as a general guideline of the topics covered. Current literature and review papers will supplement the reading materials. Hands-on exercises of selected topics will be assigned to students as groups or individual projects. These projects are designed to enhance students' understanding of the concepts of agroecosystems. Anticipated class size: 5 to 10.

6. Learning Objectives for Students:
The main objective of this course is to recognize the principle of agroecology and to compare technologies used in agroecosysems. Students will learn how ecological science influences the development of a sustainable crop production system in Guam and in other parts of the world.

For specific learning objectives, students will be able to:

a. summarize differences between conventional modern agricultural practices and the agroecosystems;
b. explain the impact of environmental factors important to sustainable agricultural practices and plant bio-security;
c. give examples of sustainable agricultural practices;
d. compare sustainable agricultural management systems;
e. discuss important issues of agroecology for applications in tropical agriculture and life sciences;
f. summarize and analyze findings of assigned projects and present these findings in writing and orally.

7. Methods of Evaluation
Student performance is evaluated by grading a written mid-term and final exam, oral presentation of group and/or individual project outlines and summary, and observation of their participation in class discussion. Also student evaluation will include grading a written paper on a selected project in addition to evaluation methods mentioned

8. Methods for Student Learning Outcomes Assessment:
Pre/Post Test, Course embedded questions; Portfolio Evaluation; Direct Observation

9. Required and Recommended Texts or Study Guides:
Textbook: Gliessman, S.R. 2007 *Agroecology: The Ecological Processes in Sustainable Food Systems.* 2nd edition CRC Press, Taylor & Francis Group, Boca Raton, FL. 384p.

10. Subsequent Courses:
None specified, although the course prepares students to pursue subsequent studies in sustainable agriculture, agribusiness, natural science, biology, environmental science, social studies.

11. Additional Course Descriptors, if any:
None

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

_____Approved _____Disapproved _____ _____
Senior Vice President, Academic & Student Affairs Date

UNIVERSITY OF GUAM
College of Natural & Applied Sciences
AG566. Agroecology for Island Sustainability
Credit Hour: 3
Semester Offered: Spring 2012

COURSE SYLLABUS

1. INSTRUCTOR

Dr. Mari Marutani, Professor of Horticulture and Sustainable Agriculture

Office:	Agriculture and Life Science (ALS) Bldg. Room 318
Phone:	735-2131
E-mail:	marutani@uguam.uog.edu
Office Hours:	M&W: 11:00 - 13:00; TTH: 9:30 - 11:30 or by appointment

CLASS HOUR: Lecture – TTH 1600-1750
CLASS ROOM: ALS Bldg. Room104

2. CATALOG COURSE DESCRIPTION:

Agroecology is the science of applying ecological concepts and principles to the design and management of sustainable food/agricultural production systems. The lecture topics include comparing structural and functional differences between natural ecosystems and agroecosystems with an emphasis on the tropical islands. The students study the resource–conservation and diversification of plant materials for agricultural sustainability. This course is offered to undergraduate and graduate students who have interested in studying plant, soil and natural resource science, environmental science, agricultural and food bio-security, socio- and human ecology and general biological sciences. This course includes three hours of lecture weekly. Prerequisite: BI100 or AG101 or AG102, or consent of instructor.

3. COURSE CONTENT:

This course will consist of 3-hour lecture per week. For each lecture, selected topics on agroecology will be presented for discussion and demonstration for students to understand how natural ecological systems being adapted in sustainable agricultural systems in Guam and other parts of the world. Lecture topics will include the introduction to agroecology, interaction between plants and environmental factors, agroecosystem diversity and management, and transition to sustainable food system. There will be requirements of taking a mid-term exam and final exam. Additionally group and individual projects will be assigned to provide students opportunities to understand in depth sustainable agroecological systems. Students will present orally their findings on assigned projects and also they will submit a written report on an assigned project.

4. RATIONAL FOR OFFERING THE COURSE:

Sustainable agroecosystems are essential for greater crop production with a minimal environment effects to natural resources in our society. This course will provide upper level undergraduate students and graduate students with the opportunity to learn how to apply ecological concepts and principles to the design and management of sustainable agricultural production. This course is especially relevant on Guam as agricultural industry is limited to confined areas, and that maintaining sound agroecosystems will be a key factor to sustain a food bio-security and sound human life on the island, especially approaching time of military

build-up and rapid urbanization on a limited land. There is no course offering similar to this course at UOG.

5. SKILLS AND BACKGROUND REQUIRED OR EXPECTED:

Basic knowledge of agriculture, biology, chemistry, environmental science, or natural sciences.

6. LEARNING OBJECTIVES FOR STUDENTS (INTENDED STUDENT LEARNING OUTCOMES - SLOs):

The main objective of this course is to recognize the principle of agroecology and to compare technologies used in agroecosysems. Students will learn how ecological science influences the development of a sustainable crop production system in Guam and in other parts of the world.

Specific Learning Outcomes (SLOs)

After completion of the course, students will be able to:

a. summarize differences between conventional modern agricultural practices and the agroecosystems;
b. explain the impact of environmental factors important to sustainable agricultural practices and plant bio-security;
c. give examples of sustainable agricultural practices;
d. compare sustainable agricultural management systems;
e. discuss important issues of agroecology for applications in tropical agriculture and life sciences;
f. summarize and analyze findings of assigned projects and present these findings in writing and orally.

7. CONCEPTUAL STRUCTURE OF THE COURSE:

During the first part of the course, the instructor will present the concepts of agroecology, technologies of agroecosystems, and a guideline of student assignments. In the second part, in addition to more lectures, the class will discuss the progress on the students' projects including problems and findings, and during the last part, the students will summarize and present and discuss the knowledge obtained during the course projects.

8. FORMAT AND ACTIVITIES IN THE COURSE:

Three (3) hour-lectures per week. Instructor will present the content of lectures using Power Point presentation and other available instructional tools. For specific topics, guest speakers will present topics in their expertise. There will be a discussion period during each class. The guideline of assignments as either group or individual projects will be provided, and follow-up discussions on the students' projects will be further elaborated with the content of lectures. Students will present orally their findings of the project(s). Students will take two exams, one mid-term and a final. Students will also submit a written paper of the project(s) at the end of semester.

9. TEXT BOOKS/REFERENCES:

Gliessman, S.R. 2007 *Agroecology: Ecological Processes in Sustainable Agriculture*. 2nd edition Ann Arbor Press: Chelsea, MI.

10. ADDITIONAL MATERIALS OR EQUIPMENT:

Additional materials for this class will be distributed when needed.

11. ASSIGNMENTS, TERM PAPERS AND EXAMS:

a. Active participation to class discussion
b. Outline and summary of the assigned project
c. Oral presentation on the assigned project
d. Exams: Mid-term and final exam
e. Written paper on the assigned project

12. EVALUATION AND GRADES:

For graduate students:

a. Class participation in discussion	50 points
b. Outline and summary of the project	50 points
c. Oral presentation	100 points
d. Midterm	300 points
e. Final Exam	500 points
f. Term paper of the project	200 points
Total	1200 points

Grade: A >= 90 %
B 80 – 89 %
C 70 - 79 %
D 60 - 69 %
F below 59 %

13. COURSE POLICIES:

Attendance is **required**. Submission of reports must be on time. There will be no make-up exams except if instructor's consent is obtained prior to an exam date. Students are encouraged to read assigned reading materials before coming to the class and take detailed notes during each class.

14. SPECIAL NEEDS:

"If you are a student with a disability who will require a accommodation(s) to participate in this course, please contact me or the Institutional Compliance Officer privately to discuss your specific needs. You will need to provide me with documentation concerning your need for accommodation(s) from the EEO/ADA and TITLE IX Office. If you have not registered with the EEO/ADA and Title IX Office, you should do so immediately at 735-2244, (TTY) 735-2243 to coordinate your accommodation request."

15. CALENDAR OR SCHEDULE:

Discussion Topics in Class

Part I. Introduction of Agroecology
1. The need for sustainable food production systems
2. The agroecosystem concept

Part II. Plants and Environmental Factors
3. The Plant

4. Light
5. Temperature
6. Humidity and Rainfall
7. Wind
8. Soil
9. Water in the soil
10. Fire
11. Biotic Factors
12. The Environmental Complex

Part III. System-Level Interactions

13. Population Processes in Agriculture: Dispersal, Establishment, and the Ecological Niche
14. Genetic Resources in Agroecosystems
15. Species Interaction in Crop Communities
16. Agroecosystem Diversity and Stability
17. Disturbance, Succession, and Agroecosystem Management
18. The Energetics of Agroecosystems
19. Interaction between Agroecosystems and Natural Ecosystems

Part IV. Making the Transition to Sustainability

20. Achieving Sustainability
21. From Sustainability Agriculture to Sustainable Food Systems

16. DROP DATES:

Students are required to follow the posted UOG policy found in the catalog. In general a student can withdraw from a course "voluntarily", without notifying the instructor, until mid October. Under certain circumstances a student can withdraw from classes as late as the end of the semester.

17. STUDENT WORK LOAD:

This course accounts for 3 credit hours, which consists of 3 hours of lecture per week.

18. SUPPLEMENTARY MATERIALS/ADDITIONAL RESOURCES:

Elevitch C.R. and Wilkinson K.M. (eds.) 2000. *Agroforestry Guides for Pacific Islands.* Permanent Agriculture Resources, Honolulu, HI.

Giller, K.E. and K.J. Wilson. 1991. *Nitrogen Fixation in Tropical Cropping Systems.* C.A.B. International. Wallingford, Oxon OX10 8DE, UK.

Gliessman S.R. 2006. *Field and Laboratory Investigations in Agroecology.* 2nd edition. CRC Press Boca Raton, FL.

Marutani, M., & Sablan, P. 2003. *Nitrogen Fixing Trees in Guam.* A series of Factsheets, University of Guam.

Morton, J.B., R.E. Koske, S.L.Sturmer and S.P Bentivenga. 2004. *Mutualistic Arbuscular Endomycorrhizal Fungi.* In Mueller, G.M., G. F. Bills, and M.S. Foster (eds.) *Biodiversity of Fungi: Inventory and Monitoring Methods*. Chap 15:317-336.

Rickerl, D., C. Francis, R. Aiken and C. Wayne Honeycutt. 2004. *Agroecosystem Analysis* (Agronomy, No. 43) American Society of Agronomy Inc. (ISBN 0-89118-153-9)

Tuquero, J., & Marutani, M. 2009. Corn seedlings grew better with Mycorrhizal inoculation in four irrigation regimes in Guam's calcareous soil. *Plant, Soil, Food, Natural Resources, and Sustainable Agriculture Factsheet 9-2*.

Varma, Ajit (ed.) 1998. *Mycorrhiza Manual*. Springer-Verlag Berlin Heidenberg, Germany.

19. CONTACT INFORMATION FOR CLASSMATES:

Exchange contact information with at least one classmate. Contact your classmate(s) if you miss class or if you want to form a study group.

AG566: Agroecology for Island Sustainability **Spring 2014**

Course Schedule

Lecture	Topics	Reading Assignment & Guest presenter
1	Introduction	
2	Introduction to Agroecology	Chap 1 &2
3	Vermicompost, medicinal plants in Guam	Handout
4	Plants and Environmental Factors	Chap 3 &4
5	Cage-free pasture range egg-layers. Plant density measurement	Yigo Station
6	Plants and Environmental Factors	Chap 5 & 6
7	Compost, Zero-Waste program in Guam	Field Trip
8	Plants and Environmental Factors: Wind No-till farming	Chap 7, Soil Scientist
9	Field Trip to Guam Farm: No-till farming in Guam	Field Trip, Handout
10	Plants and Environmental Factors	Chap 8,9,10
11	Plants and Environmental Factors: Biotic Factors, The Environmental Complex	Chap 11&12
12	Beneficial Soil Microorganisms in Guam	Handout
13	Rhizobia/Mycorrhiza Trial Set-up	Handout
14	Invasive Species and Chemical Ecology	Handout
15	Population Ecology of Agroecosystems	Chap 13
16	Genetic Resources in Agroecosystems	Chap 14
	Midterm Exam	
17	Species Interaction in Crop Community Agroecosystem Diversity and Stability	Chap 15 Chap 16
18	Disturbance, Succession, and Agroecosystem Management The Energetics of Agroecosystems,	Chap 17 Chap 18
19	Animal in Agroecosystems, Converting to Ecologically Based Management	Chap 19 Chap 20
20	Indicators of Sustainability, Landscape Diversity and Agroecosystem Management	Chap 2I Chap 22
21	Rhizobia/Mycorrhiza Trial data taking	Handout
22	Rhizobia/Mycorrhiza Trial data analysis	Handout
23	Composting Methods and Food Waste Management	Handout
24	Island Sustainability	Handout
25	Whole-Farm Planning and Analysis	Ref. Rickeri& Frances pp.63-73
26	Agroforesty in Micronesia	Handout
27	Organic Agriculture in Guam	Handout
28	Culture, Community and Sustainability	Chap 23
29	From Sustainable Agroecosystem to Sustainable Food System	Chap 24
	Final Exam	

Faculty Senate Office
University of Guam
Received By: LM
11/15/2016 12:20 pm
Date & Time

No. 5277e

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Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Public Health Nutrition
2. Catalog Number: AL 539 (New course may not duplicate active or inactive course number.)
3. Course Type: [X] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,…94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X] Graduate (/G) [ ] Both
5. Credit Hours: 3
6. Is this course cross-listed with another department? No
   If so, list the cross-listed catalog number (s)? ____
7. What session(s) will the course be offered? [X] Fall [ ] Spring [ ] Summer [ ] All
8. What will be the yearly cycle for this course?
   [ ] All Years [ ] Even Years [X] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SP 2017 Length of Instruction (Weeks): 15
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B. Prerequisites Catalog # Prerequisite Course Title

CF 339	Community Nutrition
CF 430	Nutrition Throughout the Lifespan

    C. Additional Prerequisites: ____
11. CATALOG DESCRIPTION: Use complete sentences and present tense.

12. This course covers farm animal products and provides a general overview of the livestock and poultry industry, relative to biological concepts such as genetics, nutrition, reproduction and disease prevention. This includes biotechnology along with environmental challenges.

13. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

Online Journals available: Journal of Animal Science; Journal of Dairy Science; Poultry Science Journal.

14. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE

To meet requirement of new Master's Program Track on Sustainable Agriculture and Natural Resources.

15. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PROJECTED SIZE.

Class size will vary from five to twenty five as the program is expected to grow rapidly in the next five years.

16. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

CNAS faculty including adjunct faculty are available.

17. ADDITIONAL INFORMATION:

None

18. ATTACH COURSE OUTLINE:

See attached.

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		
Administrative Chair		4-5-2013
Chair, College AAC/CC		5/16/13

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Office of Academic [redacted] Student Affairs

Dean, of College		2/14/15
UCRC/GCRC		12 Dec 2016
President, Faculty Senate (if substantive)	Kath Moots (Endorsement of UCRC/GCRC Recommendation)	2 Dec 2016

APPROVED:

SENIOR VICE PRESIDENT ACADEMIC & STUDENT AFFAIRS	12-14-2016 DATE

UNIVERSITY
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Unibetsedåt GUAHAN

Office of Academic and Student Affairs

NEW COURSE OUTLINE FORM

AL 539

College: College of Natural and Applied Sciences

Course Number: CF 5XX

Course Title: Public Health Nutrition

Credit Hours: 3

Date of Final Approval: _____

Semester Offered: Fall Odd

Course counts as:
_____ general education requirement
__X__ part of Agriculture & Life Sciences MS Program
__X__ elective

1. Catalog Description:
   This course examines public health nutrition issues for various segments of the population; nutritional components of community assessment; program planning and evaluation; and policy issues pertaining to the nutritional status of the population. Prerequisites: CF339 and CF430.

2. Course Content:
   The materials, methods and programs that are appropriate for nutrition education are explored in this course. This course is designed to prepare the student be skilled in the behavioral sciences and social marketing in order to impact the preventable etiologies of obesity and chronic diseases. Topics to be covered include: advocating for federal legislation; marketing to the public; managing and mentoring personnel; assessing nutritional needs of the community; protecting the food supply; nurturing women and children; and services for the aging and the underserved.

3. Rationale for the Course:
   The rationale for this course is to develop student's critical thinking and understanding of public health nutrition issues in the United States today. This course extends the concepts introduced in CF339 Community Nutrition.

4. Skills and Background Required or Expected:
   Prerequisites for CF 5XX are CF339 and CF430.

5. Teaching Methodologies and Anticipated class size:
   Class size will be limited to 15 in order for students to have many opportunities for group discussions and oral presentations. This course will include individual, group and cooperative learning methods. Classes will consist of lectures, group discussions, outside readings, small group activities, oral presentations and written assignments.

6. Learning Objectives for Students:

- As a result of taking this course the learner should be able to define the role of nutrition in public health service throughout American history, and describe how science affects decisions made in the name of "public health".
- As a result of taking this course the learner should be able to discuss how public health nutritionists target care for those at highest risk through nutrition needs assessment of the community.
- As a result of taking this course the learner should be able to describe how science and needs assessment shape the policies that affect the public's nutritional health.
- As a result of taking this course the learner should be able to discuss how public health nutritionists provide services for the differing groups of Americans.
- As a result of taking this course the learner should be able to describe how the public's nutritional health is protected by safeguarding the food supply and securing adequate food for the public (food security).
- As a result of taking this course the learner should be able to describe how public health nutrition is funded.
- As a result of taking this course the learner should be able to describe effective management skills that enable public health nutrition professionals to perform services that are necessary to fulfill mission.

7. Methods of Evaluation

Methods of evaluation consist of written tests, assignments and class project. These components are weighted as follows: tests 35%; assignments 35%; project 30%.

8. Methods for Student Learning Outcomes Assessment:

Depending on Instructor and Program Faculty, any one or more of the following may be selected: Pre/Post Test, Course embedded questions; Standardized exams; Portfolio Evaluation; Direct Observation; and Capstone Course Evaluation.

9. Required and Recommended Texts or Study Guides:

Mildred Kaufman. Nutrition in Promoting the Public's Health: Strategies, Principles, and Practice, Jones and Bartlet Publishers; Sudbury, Massachusetts (2007).

10. Subsequent Courses:

N/a

11. Additional Course Descriptors, if any:

N/a

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

Approved _____ Disapproved

Senior Vice President, Academic & Student Affairs

12-13-2016
Date

UNIVERSITY OF GUAM
COURSE OUTLINE

College: College of Natural and Applied Sciences

Course Number: AL 539

Course Title: Public Health Nutrition

Credit Hours: 3

Date of Final Approval:

Semester Offered: Fall Odd

Course counts as:

____	general education requirement
X	part of Agriculture & Life Sciences MS program
X	elective

1. Catalog Description:

This course examines public health nutrition issues for various segments of the population; nutritional components of community assessment; program planning and evaluation; and policy issues pertaining to the nutritional status of the population. Prerequisites: CF339 and CF430.

2. Course Content:

The materials, methods and programs that are appropriate for nutrition education are explored in this course. This course is designed to prepare the student be skilled in the behavioral sciences and social marketing in order to impact the preventable etiologies of obesity and chronic diseases. Topics to be covered include: advocating for federal legislation; marketing to the public; managing and mentoring personnel; assessing nutritional needs of the community; protecting the food supply; nurturing women and children; and services for the aging and the underserved.

3. Rationale for the Course:

The rationale for this course is to develop student's critical thinking and understanding of public health nutrition issues in the United States today. This corse extends the concepts introduced in CF339 Community Nutrition.

4. Skills and Background Required or Expected:

Prerequisites for AL 539 are CF 339 and CF430.

5. Teaching Methodologies and Anticipated class size:

Class size will be limited to 15 in order for students to have many opportunities for group discussions and oral presentations. This course will include individual, group and cooperative learning methods. Classes will consist of lectures, group discussions, outside readings, small group activities, oral presentations and written assignments.

6. Learning Objectives for Students:

- As a result of taking this course the learner should be able to define the role of nutrition in public health service throughout American history, and describe how science affects decisions made in the name of "public health".
- As a result of taking this course the learner should be able to discuss how public health nutritionists target care for those at highest risk through nutrition needs assessment of the community.
- As a result of taking this course the learner should be able to describe how science and needs assessment shape the policies that affect the public's nutritional health.
- As a result of taking this course the learner should be able to discuss how public health

nutritionists provide services for the differing groups of Americans.

- As a result of taking this course the learner should be able to describe how the public's nutritional health is protected by safeguarding the food supply and securing adequate food for the public (food security).
- As a result of taking this course the learner should be able to describe how public health nutrition is funded.
- As a result of taking this course the learner should be able to describe effective management skills that enable public health nutrition professionals to perform services that are necessary to fulfill mission.

7. Methods of Evaluation

Methods of evaluation consist of written tests, assignments and class project. These components are weighted as follows: tests 35%; assignments 35%; project 30%.

8. Required Texts:

Mildred Kaufman. Nutrition in Promoting the Public's Health: Stragegies, Principles, and Practice, Jones and Bartlet Publishers; Sudbury, Massachusetts (2007).

9. Subsequent Courses:

N/a

10. Additional Course Descriptors, if any:

✓ Approved _____ Disapproved

Senior Vice President, Academic & Student Affairs

12-13-2016
Date

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

UNIVERSITY OF GUAM

College of Natural & Applied Sciences

AL 539 NUTRITION

COURSE SYLLABUS

INSTRUCTOR

Rachael T. Leon Guerrero, Ph.D., R.D., L.D., Professor of Nutrition

Office:	Agriculture Bldg, Room 113c
Phone:	735-2026 (can leave message @735-2003)
Fax:	734-2040
E-mail:	rachaeltlg@uguam.uog.edu
Office Hours:	Mondays 11:00 am - 12:00 pm

CATALOG DESCRIPTION

This course examines public health nutrition issues for various segments of the population; nutritional components of community assessment; program planning and evaluation; and policy issues pertaining to the nutritional status of the population. Prerequisites: CF339 and CF430.

RATIONALE FOR OFFERING THE COURSE

The rationale for this course is to develop student's critical thinking and understanding of public health nutrition issues in the United States today. This course extends the concepts introduced in CF339 Community Nutrition.

INTENDED STUDENT LEARNING OUTCOME

The specific intended outcomes for this course are that during, or by the end of the course, students will be able to:

1. define the role of nutrition in public health service throughout American history, and describe how science affects decisions made in the name of "public health".
2. discuss how public health nutritionists target care for those at highest risk through nutrition needs assessment of the community.
3. describe how science and needs assessment shape the policies that affect the public's nutritional health.
4. discuss how public health nutritionists provide services for the differing groups of Americans.
5. describe how the public's nutritional health is protected by safeguarding the food supply and securing adequate food for the public (food security).
6. describe how public health nutrition is funded.
7. describe effective management skills that enable public health nutrition professionals to perform services that are necessary to fulfill mission.

COURSE CONTENT

The materials, methods and programs that are appropriate for nutrition education are explored in this course. This course is designed to prepare the student be skilled in the behavioral sciences and social marketing in order to impact the preventable etiologies of obesity and chronic diseases. Topics to be covered include: advocating for federal legislation; marketing to the public; managing and mentoring personnel; assessing nutritional needs of the community; protecting the food supply; nurturing women and children; and services for the aging and the

underserved.

COURSE STRUCTURE AND FORMAT

This course has been structured to follow the progression of the required textbook "Nutritional Assessment". The course will proceed linearly with Chapters 1 to 11. Information will be delivered using PowerPoint. Class discussion will be encouraged after lecture.

REQUIRED TEXTBOOK AND SUGGESTED READINGS

Mildred Kaufman. Nutrition in Promoting the Public's Health: Strategies, Principles, and Practice, Jones and Bartlet Publishers; Sudbury, Massachusetts (2007).

COURSE POLICIES

You are responsible for your learning! Take full advantage of the resources available, including the textbook, lectures, activities, assignments, and office hours. I recommend that you attend every lecture period, but I do not usually take attendance. If something prevents you from attending class, or if I cannot give a class because of absence, typhoon, etc., you are still responsible to keep up with the reading/study. Contact a classmate for copies of new handouts if necessary.

As a courtesy to the instructor and to your classmates, in order to cause the least disruption to your fellow learners:

1) Please avoid coming late to class or leaving early. If you absolutely must, come in quietly. If you need to use the restroom, if possible please wait until there is an activity.
2) Please don't talk to each other when the instructor is addressing the class. If you want to catch-up with your friends/classmates, save it for after class.
3) Please turn off all cell phones, MP3 players or other devices, with or without text messages and earphones. Contact instructor before class begins if you need to make special arrangements for an emergency situation.

Professional and ethical conduct is expected at all times. Unethical conduct includes any form of cheating, including: plagiarism. The term "cheating" includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, or examinations, e.g., looking at other students' answers, using crib notes (including electronic), getting information from another person via ANY kind of communication; (2) dependence upon the aid of sources beyond those authorized b y the instructor in writing papers/reports/case studies, solving problems, or carrying out other assignments; (3) the acquisition, without permission, of tests or other academic material belonging to a member of the University faculty or staff; or (4) not doing your own work on case studies and assignments, doing someone else's work for them, or allowing someone else to copy your work. "Plagiarism" includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgement. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. Because the University of Guam is an academic community with high professional standards, instruction is disrupted and undermined by dishonesty. Any evidence of cheating will result in a "0" for that assignment/exam or possibly an "F" for the entire course — final decision to be determined by the course instructor.

During the course of the semester, 2 exams will be administered. Make-up exams will NOT be given. If you miss a test for a valid reason (to be determined at discretion of instructor), I will average it out of your score, otherwise your score will = 0. You MUST tell the instructor AS SOON AS POSSIBLE if you have such a valid reason; and if possible, notify the instructor IN ADVANCE if you are unable to take the exam.

All assignments are due the day noted in the course syllabus unless 24-hour notice is given with a valid excuse (like giving birth or admitted to hospital). Otherwise, late assignments will be penalized 10% for each weekday late. It is the responsibility of the student to know when assignments are due and have them submitted to the instructor on time.

GRADING SYSTEM/EVALUATION METHODOLOGIES:

Summary of Course Requirements	points	%•
1. 2 Exams (each exam worth 100 points)	200	50%
2. 5 Quizzes	100	25%
3. Project/Research	100	25%
Total	*400*	*100%*

COURSE CALENDAR

Date	Topic	Chapter	Due
xx/xx	Introduction / First day of class		
xx/xx	Role of Nutrition in Public Health	1	
xx/xx	Applying Nutrition Science to Public's Health	2	
xx/xx	Community Needs Assessment	3	
xx/xx	continued		
xx/xx	Those at Highest Nutritional Risk	4	
xx/xx	Child Obesity	5	
xx/xx	Creating Public Policy	7	
xx/xx	Influencing Policies	8	
xx/xx	Role of USDA	9	
xx/xx	Mothers, Infants, Children	10	
xx/xx	Disease Prevention	11	
xx/xx	Elderly Nutrition Services	12	
xx/xx	continued		
xx/xx	**Exam #1 (Chapters 1 -12)**		
xx/xx	Food Service Standards in Group Care	15	
xx/xx	continued		
xx/xx	continued		
xx/xx	Safe Food Supply	16-18	
xx/xx	continued		
xx/xx	Planning/Evaluation of Nutrition Services	19	
xx/xx	continued		
xx/xx	continued		
xx/xx	Data Management	20	
xx/xx	continued		
xx/xx	Financial Management	21	
xx/xx	continued		
xx/xx	Staffing & Personnel Issues	22-24	
xx/xx	continued		
xx/xx	continue/wrap up		
xx/xx	**Exam #2**		

***This schedule is tentative, and subject to change. Any changes will be announced in class.*

WITHDRAWL DATES

The deadline for 'Voluntary Withdrawal' is Month Date Year; you must withdraw at the UOG Records Office. If you want to withdraw after this date, you must file a 'Petition for Withdrawal' by Month, Date, Year. Forms are available at the UOG Admissions and Records Office.

UOG DISABILITIES POLICY

In accordance with the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973, the University of Guam does not discriminate against students and applicants on the basis of disability in the administration of its educational and other programs. The University offers reasonable accommodations for a student or applicant who is otherwise qualified, if the accommodation is reasonable, effective and will not alter a fundamental aspect of the University's program nor will otherwise impose an undue hardship on the University, and/or there are not equivalent alternatives. Students are expected to make timely requests for accommodations using procedure described at: www.uog.edu/eeo/PolicyDisability.pdf. If appropriate, the University may choose to consult with such individuals, at or outside the University, to provide expertise needed to evaluate the request for accommodation. *Each student bears the responsibility for initiating and then documenting a disability-related request for accommodation in the manner requested in this Policy.*

SPECIAL NEEDS (EEO/ADA)

If you are a student with a special need who will require an accommodation(s) to participate in this course, please contact the instructor privately to discuss your specific needs. You will need to provide me with documentation concerning your needs for accommodation(s) from the EEO/ADA office. If you have not registered with the EEO/ADA office, you should do so immediately at 735-2243/2244/2971 (TTY) to coordinate your accommodation request.

Faculty Senate Office
University of Guam
Received By:
11/15/2016 12:20 pm
Date & Time

No. 5277f

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Nutritional Epidemiology
2. Catalog Number: AL 505 (New course may not duplicate active or inactive course number.)
3. Course Type: [X] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,...94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X] Graduate (/G) [ ] Both
5. Credit Hours: 3
6. Is this course cross-listed with another department? No
   If so, list the cross-listed catalog number (s)? ____
7. What session(s) will the course be offered? [ ] Fall [X] Spring [ ] Summer [ ] All
8. What will be the yearly cycle for this course?
   [ ] All Years [ ] Even Years [X] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SP 2017 Length of Instruction (Weeks): 15
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B. Prerequisites Catalog # Prerequisite Course Title

BI/EV 507	Advanced Statistical Methods

    C. Additional Prerequisites: ____
11. CATALOG DESCRIPTION: Use complete sentences and present tense.

This is a 3-credit course that explores the complex relationships between diet and the major diseases of Western civilization, such as cancer and atherosclerosis. Topics that will be covered include: research strategies in nutritional epidemiology; methods of dietary assessment (using data on food intake, biochemical indicators of diet, and measures of body size and composition); reproducibility and validity of dietary assessment methods; nutrition surveillance; and diet-disease associations. Prerequisites: BI/EV507.

12. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

Online Journals available: Journal of Nutrition. Journal of American Dietetic Association. Journal of the Academy of Nutrition and Dietetics,

13. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE

To meet requirement of new Master's Program Track on Sustainable Agriculture and Natural Resources.

14. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PROJECTED SIZE.

Class size is 25. This course will include individual, group and cooperative learning methods. Classes will consist of lectures, group discussions, outside readings, oral presentations, written assignments, and exams

15. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

CNAS faculty including adjunct faculty are available.

16. ADDITIONAL INFORMATION:

None

17. ATTACH COURSE OUTLINE:

See attached.

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		
Administrative Chair		4-5-2013

UNIVERSITY
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Unibetsedåt GUAHAN

Office of Academic and Student Affairs

Chair, College AAC/CC		5/16/13
Dean, of College		12 Dec 2016
UCRC/GCRC		
President, Faculty Senate (if substantive)	Kath Moots	2 Dec 2016

(Endorsement of UCRC/GCRC Recommendation)

APPROVED:

SENIOR VICE PRESIDENT
ACADEMIC & STUDENT AFFAIRS

12-13-2016
DATE

UNIVERSITY OF GUAM
COURSE OUTLINE

College: College of Natural and Applied Sciences | Course Number: AL 505

Course Title: Nutritional Epidemiology | Credit Hours: 3

Date of Final Approval: | Semester Offered: Spring Odd Years

Course counts as:

____	general education requirement	
X	part of	Agriculture & Life Science (MS) Program
X	elective	BA Consumer & Family Sciences

1. Catalog Description:

This is a 3-credit course that explores the complex relationships between diet and the major diseases of Western civilization, such as cancer and atherosclerosis. Topics that will be covered include: research strategies in nutritional epidemiology; methods of dietary assessment (using data on food intake, biochemical indicators of diet, and measures of body size and composition); reproducibility and validity of dietary assessment methods; nutrition surveillance; and diet-disease associations. Prerequisites: BI/EV507.

2. Course Content:

- Overview of Nutritional Epidemiology
- Foods and Nutrients
- Nature of Variation in Diet
- 24-Hour Dietary Recall and Food Record Methods
- Food Frequency Methods
- Reproducibility and Validity of Food-Frequency Questionnaires
- Recall of Remote Diet
- Surrogate Sources of Dietary Information
- Biochemical Indicators of Dietary Intake
- Anthropometric Measures and Body Composition
- Implications of Total Energy Intake for Epidemiologic Analysis
- Correction for the Effects of Measurement Error
- Issues in Analysis and Presentation of Dietary Data
- Nutrition, Monitoring and Surveillance
- Vitamin A and Lung Cancer
- Dietary Fat and Breast Cancer
- Diet and Coronary Heart Disease
- Folic Acid and Neural Tube Defects

3. Rationale for the Course:

This course is designed to provide the student with an understanding of the methods used to study diet and disease relationship including diet measurements, correcting for measurement error, and appropriate analysis and presentation of dietary data. The student will also be introduced to types of nutrition surveillance, which are important tools in monitoring public health nutrition status. This course builds on AL5** Public Health Nutrition.

4. Skills and Background Required or Expected:

Prerequisite for AL 505 is: BI/EV507

5. Teaching Methodologies and Anticipated class size:

Class size is 25. This course will include individual, group and cooperative learning methods. Classes will consist of lectures, group discussions, outside readings, oral presentations, written assignments, and exams.

6. Learning Objectives for Students:

- As a result of taking this course the learner should be able to differentiate among the current food composition data sources and nutrient computation systems, and the importance of each one.
- As a result of taking this course the learner should be able explain day-to-day variation in dietary data.
- As a result of taking this course the learner should be able to identify and critique the types of methods used to assess diet (food intake, biochemical indicators, body size and composition).
- As a result of taking this course the learner should be able to identify and critique the types of nutrition monitoring and surveillance.
- As a result of taking this course the learner should be able to understand the implications of total energy intake for epidemiologic analyses.
- As a result of taking this course the learner should be able to understand the concept of reproducibility and validity, and reference important literature.
- As a result of taking this course the learner should be able to identify types of measurement errors and how to correct for them.
- As a result of taking this course the learner should be familiar with classic diet-disease literature, and be able to critically review recent types of literature.

7. Methods of Evaluation

Methods of evaluation consist of written tests and assignments. These components are weighted as follows: exams, 40%; research, 20%; presentation, 15%; assignments, 15%; participation, 10%.

8. Methods for Student Learning Outcomes Assessment:

Depending on Instructor and Program Faculty, any one or more of the following may be selected: Pre/Post Test, Course embedded questions; Standardized exams; Presentation Feedback; Direct Observation; and Course Evaluation.

9. Required and Recommended Texts or Study Guides:

Willett W. 1998. Nutritional Epidemiology. 2nd ed. New York (NY): Oxford University Press. 514 p. (ISBN: 978-0-19-512297-8)

10. Subsequent Courses:

None

11. Additional Course Descriptors, if any:

None.

✓ Approved _____ Disapproved

Senior Vice President, Academic & Student Affairs

12-13-2016
Date

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

UNIVERSITY OF GUAM
College of Natural & Applied Sciences
SPRING ***

AL 505 NUTRITIONAL EPIDEMIOLOGY

Days: ***
Time: ***
Place: ***

INSTRUCTOR

Yvette C. Paulino, PhD
Office: ***
Phone: ***
E-mail: yvettecpaulino@uguam.uog.edu
Office Hours: ***

COURSE DESCRIPTION

This is a 3-credit course that explores the complex relationships between diet and the major diseases of Western civilization, such as cancer and atherosclerosis. Topics that will be covered include: research strategies in nutritional epidemiology; methods of dietary assessment (using data on food intake, biochemical indicators of diet, and measures of body size and composition); reproducibility and validity of dietary assessment methods; nutrition surveillance; and diet-disease associations. Prerequisites: BI/EV507.

RATIONALE FOR OFFERING THE COURSE

This course is designed to provide the student with an understanding of the methods used to study diet and disease relationship including diet measurements, correcting for measurement error, and appropriate analysis and presentation of dietary data. The student will also be introduced to types of nutrition surveillance, which are important tools in monitoring public health nutrition status. This course builds on AL5**Public Health Nutrition.

INTENDED STUDENT LEARNING OUTCOME

The specific intended outcomes for this course are that during, or by the end of the course, students will he able to (as evaluated through exams, presentations, assignments and discussions):

1. differentiate among the current food composition data sources and nutrient computation systems, and the importance of each one;
2. explain day-to-day variation in dietary intake;
3. identify and critique the types of methods used to assess diet (food intake, biochemical indicators, body size and composition);
4. identify and critique the types of nutrition monitoring and surveillance;
5. understand the implications of total energy intake for epidemiologic analyses;
6. understand the concept of reproducibility and validity, and reference important literature;
7. identify types of measurement errors and how to correct for them; and
8. review classic literature on associations and diet and disease (cancer, heart disease, neural tube defects).

COURSE STRUCTURE AND FORMAT

The course has been structured so that the interpretation of nutrition literature (Chapter 15) is reviewed first. This is to ensure that students are provided with the background needed to conduct nutrition

research. The course will proceed linearly with Chapters 1 to 14. Information will be delivered using PowerPoint. Class discussion will be encouraged after lecture.

REQUIRED TEXTBOOK AND SUGGESTED READINGS

Willett W. 1998. Nutritional Epidemiology. 2nd ed. New York (NY): Oxford University Press. 514 p. (ISBN: 978-0-19-512297-8)

Review of the suggested supplemental resources at the end of each chapter is highly encouraged. The resources may include journal articles, other textbooks, and Internet links.

COURSE POLICIES

You are responsible for your learning! I recommend that you attend every lecture period, but I do not usually take attendance. If something prevents you from attending class, or if I cannot give a class because of absence, typhoon, etc., you are still responsible to keep up with the reading/study. Contact a classmate for copies of new handouts if necessary.

As a courtesy to the instructor and to your classmates, in order to cause the least disruption to your fellow learners:

1) Please avoid coming late to class or leaving early. If you absolutely must, come in quietly.
2) Please don't talk to each other when the instructor is addressing the class. If you want to catch-up with your friends/classmates, save it for after class.
3) Please turn off all cell phones, MP3 players or other devices, with or without text messages and earphones. Contact instructor before class begins if you need to make special arrangements for an emergency situation.

Professional and ethical conduct is expected at all times. Unethical conduct includes any form of cheating, including: plagiarism. The term "cheating" includes, but is not limited to: (1) use of any unauthorized assistance in taking exams, e.g., looking at other students' answers, using crib notes (including electronic), getting information from another person via ANY kind of communication; (2) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, solving problems, or carrying out other assignments; (3) the acquisition, without permission, of tests or other academic material belonging to a member of the University faculty or staff; or (4) not doing your own work, doing someone else's work for them, or allowing someone else to copy your work. "Plagiarism" includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgement. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. Because the University of Guam is an academic community with high professional standards, instruction is disrupted and undermined by dishonesty. Any evidence of cheating will result in a "0" for that assignment/exam or possibly an "F" for the entire course — final decision to be determined by the course instructor.

UOG DISABILITIES POLICY

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www.uog.edu/eeo/PolicyDisability.pdf. If appropriate, the University may choose to consult with such individuals, at or outside the University, to provide expertise needed to evaluate the request for accommodation. *Each student bears the responsibility for initiating and then documenting a disability-related request for accommodation in the manner requested in this Policy.*

SPECIAL NEEDS (EEO/ADA)

If you are a student with a special need who will require an accommodation(s) to participate in this course, please contact the instructor privately to discuss your specific needs. You will need to provide me with documentation concerning your needs for accommodation(s) from the EEO/ADA office. If you have not registered with the EEO/ADA office, you should do so immediately at 735-2244 (telephone) or 734-0430 (fax) to coordinate your accommodation request.

GRADING SYSTEM/EVALUATION METHODOLOGIES:

Summary of Course Requirements	%
1. Exams	40
2. Research	20
3. Assignments	15
4. Presentation	15
5. Participation	10
Total	*100%*

A schedule of due dates is provided. There is no make-up for presentations; however, you may switch presentation dates with a classmate with instructor approval. Make-up for an exam requires instructor approval in advance.

WITHDRAWL DATES

The deadline for 'Voluntary Withdrawal' is ***; you must withdraw at the UOG Records Office. If you want to withdraw after this date, you must file a 'Petition for Withdrawal' by *** Forms are available at the UOG Admissions and Records Office.

STUDENT WORKLOAD

READ BEFORE COMING TO CLASS! You should plan to spend an average of 2 hours studying for every hour of lecture class time. Since this is a 3 credit hour course, that equates to 6 hours of studying per week. I suggest you structure those 6 hours per week as follows:

- 2 hours pre-reading the textbook before class — read the sections that are assigned.
- 2 hours re-reading the textbook and revising your notes after class — focus on the specific learning objectives for that particular topic.
- 2 hours doing assignments, performing a self-test on the specific learning objectives, and reviewing additional resources. The specific objectives can easily be converted to test questions.

COURSE CALENDAR

Date	Topic	Chapter	Due
Session 1	Introduction Overview of Nutritional Epidemiology	1	
Session 2	Foods and Nutrients	2	
Session 3	24-Hour Dietary Recall and Food Record Methods	3	
Session 4	Food Frequency Methods	4	Student Presentation
Session 5	Reproducibility and Validity of FFQ	5	
Session 6	Recall of Remote Diet	6	
Session 7	Review		
Session 8	Exam 1		
Session 9	Surrogate Sources of Dietary Information	7	Student Presentation
Session 10	Biochemical Indicators of Dietary Intake	8	Student Presentation
Session 11	Anthropometric Measures and Body Composition	9	Student Presentation
Session 12	Implications of Total Energy Intake	10	Student Presentation
Session 13	Corrections for the Effects of Measurement Error	11	Student Presentation
Session 14	Review		
Session 15	Exam 2		
Session 16	Issues in Analysis and Presentation of Dietary Data	12	
Session 17	*Continuation*		Student Presentation
Session 18	Nutrition, Monitoring and Surveillance	13	Student Presentation
Session 19	Vitamin A and Lung Cancer	14	Student Presentation
Session 20	Dietary Fat and Cancer	15	Student Presentation
Session 21	Diet and Coronary Heart Disease	16	Student Presentation
Session 22	Folic Acid and Neural Tube Defects	17	Student Presentation
Session 23	Review		
Session 24	Exam 3		
Session 25	Research		Presentation
Session 26	Research		Presentation
Session 27	Research		Presentation
Session 28	Research		Presentation
Session 29	Review		
Session 30	Final Exam		

Faculty Senate Office
University of Guam
cm
Received By:
11/15/2016 12:20 pm
Date & Time

No. 5277g

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Internship in Sustainable Agriculture, Food, and Natural Resources
2. Catalog Number: AL698 (New course may not duplicate active or inactive course number.)
3. Course Type: [X] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,…94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X]Graduate (/G) [ ] Both
5. Credit Hours: 1-3
6. Is this course cross-listed with another department? No
   If so, list the cross-listed catalog number (s)? _____
7. What session(s) will the course be offered? [ ] Fall [ ]Spring [ ] Summer [X] All
8. What will be the yearly cycle for this course?
   [X] All Years [ ] Even Years [ ] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SP 2016 Length of Instruction (Weeks): 16
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B. Prerequisites Catalog # Prerequisite Course Title
    _____ _____
    _____ _____
    _____ _____
    C. Additional Prerequisites: Consent of Instructor

11. CATALOG DESCRIPTION: Use complete sentences and present tense.

The internship course provides students opportunities to work in the academic and professional areas of their interest under the supervision of the expert in the field. For the internship course, a "Student Contract Form" needs to be signed by student, instructor of the course, advisor of student, Chair of the major graduate program, Dean of the college and supervisor of the participating party such as other academic institution, a government agency, a private business sector, and a non-profit organization engaged in activities that relate to sustainable agriculture, food, nutrition, and natural resources. Each credit (1 credit) requires 40 hours of job training per semester and the 3-credit internship course requires 120 hours. Student may take up to a maximum of six credit hours for completion of the program.

12. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

Literature search using PREL, EBISCO (Database: AGRICOLA, MEDLINE, GREEN LINE) through RFK Library on-line search. Additionally supplemental reading materials will be provided by instructor.

13. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE.

Internship course will be essential for graduate students of sustainable agriculture, food and natural resources program to gain an experience in a professional field to increase the knowledge of the subject and to see a job site or other academic institution. Experiences obtained from the internship program at off-campus environments will enhance and expand the student knowledge of the field.

14. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PRJECTED SIZE.

Anticipated class size is 1-5. Internship course is offered as individual needs of students in the program. It is common to have one-to one instruction style of instruction.

15. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

Faculty in Agriculture and Life Science Division will teach this course.

16. ADDITIONAL INFORMATION: None

17. ATTACH COURSE OUTLINE: See attached.

UNIVERSITY
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Unibetsedåt GUAHAN

Office of Academic and Student Affairs

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		
Division Chair		4-5-2013
Chair, College AAC/CC		5/16/13
Dean, of College		2/16/15
UCRC/GCRC	12/2/2014	
President, Faculty Senate (if substantive)	(Endorsement of UCRC/GCRC Recommendation)	2 Dec 2016

APPROVED:

SENIOR VICE PRESIDENT
ACADEMIC & STUDENT AFFAIRS

12-13-2016
DATE

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

NEW COURSE OUTLINE FORM

College: College of Natural & Applied Sciences Course Number: AL698

Course Title: Internship in sustainable agriculture, food and natural resources Credit Hrs: 1-3

Date of Final Approval: _____ Semester Offered: Spring, Summer, Fall

Course counts as:

_____	General education requirement
X	Part of Sustainable Agriculture, Food and Natural Resources graduate Program
X	Elective

1. Catalog Description:
The internship course provides students with opportunities to work in the academic and professional areas of their interest under the supervision of the expert in the field. For the internship course, a AL698 Student Contract Form needs to be signed by Student, Course Instructor, Student's Advisor, Chair of the graduate program, Dean of the college, and Supervisor of the participating party such as another academic institution, a government agency, a private business, or a non-profit organization engaged in activities that relate to sustainable agriculture, food, nutrition, and natural resources. Each credit (1 credit) requires 40 hours of job training per semester and the 3-credit internship course requires 120 hours. Student may take up to a maximum of six credit hours for completion of the program.

2. Course Content:
Student and Supervisor of the participating party will develop a list of objectives and a schedule of activities of the internship program. By the end of first week of the internship program, the program plan must be submitted to Instructor. Student will report to work at job/work site to perform scheduled activities. Weekly report of activities will submit to Instructor. Supervisor will provide his/her evaluation of student activities to Instructor who will give a grade.

3. Rationale for the Course:
Internship program will provide students with opportunities to work under the supervision of an expert in the field of their interest. Experience obtained from the internship program will enhance and excel student knowledge of the field.

4. Skills and Background Required or Expected:
Essential knowledge needed to accomplish this course including writing, basic mathematics, and some knowledge of agriculture, biology, chemistry, environmental science, natural sciences, and the subjects in the field of the internship program. Communication skills are required to interact with the supervisor and submit reports to the instructor.

5. Teaching Methodologies and Anticipated class size:
An arrangement will be made between Instructor, Student and Supervisor of the site of internship program. Student will submit AL698 Student Contract Form to obtain necessary signatures of instructor, academic administrators of UOG as well as Supervisor of the intern program. After specific objectives of the program are determined for the internship program, student will report and work under supervision of representatives at the site of the program. Student performance will be assessed by his/her attendance and quality of work evaluated by Supervisor. Instructor will review a weekly report from Student via e-mail and provide feedback to Student. Anticipated class size: 1 to 5.

6. Learning Objectives for Students:
The main objective of this course is to recognize and obtain some skills of specialized areas in sustainable agriculture, food and natural resources from experts in the field.

For specific learning objectives, students will be able to:

a. complete assigned work at the site of the internship program
b. summarize and analyze findings of assigned projects
c. present these findings and accomplishments in writing and orally.

7. Methods of Evaluation
Evaluation of weekly student activity report; Evaluation report from the supervisor

8. Methods for Student Learning Outcomes Assessment:
Portfolio Evaluation; Interview

9. Required and Recommended Texts or Study Guides:
The list of recommended reading materials will be provided by Supervisor of the intern program as needed.

10. Subsequent Courses:
None specified, although the course prepares students to pursue subsequent studies in sustainable agriculture, agribusiness, natural science, biology, environmental science, social studies, food and nutrition sciences, and other areas of island sustainability.

11. Additional Course Descriptors, if any:
None

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

✓ Approved _____ Disapproved

Senior Vice President, Academic & Student Affairs — 12-13-2016 Date

UNIVERSITY OF GUAM
College of Natural & Applied Sciences
AL698 Credit Hour: 1-3
Semester Offered: Fall, Spring, Summer

COURSE SYLLABUS

1. INSTRUCTOR Staff
CLASS HOUR: TBA
CLASS ROOM: TBA

2. CATALOG COURSE DESCRIPTION:
The internship program provides students with opportunities to work in the academic and professional areas of their interest under the supervision of the expert in the field. For the internship course, a "AL698 Student Contract Form" needs to be signed by Student, Course Instructor, Student's Advisor, the Chair of the graduate program, The Dean of the college, and Supervisor of the participating party such as another academic institution, a government agency, a private business, or a non-profit organization engaged in activities that relate to sustainable agriculture, food, nutrition, and natural resources. Each credit requires 40 hours of job training per semester and the 3-credit internship course requires 120 hours. Student may take up to a maximum of six credit hours for completion of the program.

3. COURSE CONTENT:
Student and Supervisor of the participating party will develop a list of objectives and a schedule of activities of the internship program. By the end of first week of the internship program, the program plan must be submitted to Instructor. Student will report to work at job/work site to perform scheduled activities. Weekly report of activities will submit to Instructor. Supervisor will provide his/her evaluation of student activities to Instructor who will give a grade.

4. RATIONAL FOR OFFERING THE COURSE:
Internship program will provide students with opportunities to work under the supervision of an expert in the field of their interest. Experience obtained from the internship program will enhance and excel student knowledge of the field.

5. SKILLS AND BACKGROUND REQUIRED OR EXPECTED:
Communication skills are required to interact with the supervisor and submit reports to the instructor. Some knowledge is required in the areas of agriculture, biology, chemistry, environmental science, natural sciences, and the subjects of the field of internship program.

6. LEARNING OBJECTIVES FOR STUDENTS (INTENDED STUDENT LEARNING OUTCOMES - SLOs):

The main objective of this course is to recognize and obtain specialized skills in sustainable agriculture, food and natural resources from experts in the field.

Specific Learning Outcomes (SLOs)
After completion of the course, students will be able to:

a. list assigned work at the site of the internship program
b. summarize and analyze findings of assigned projects
c. present these findings and accomplishments in writing and orally.

7. CONCEPTUAL STRUCTURE OF THE COURSE:

Student will perform activities at off-campus site under supervision of a representative of an internship program. Student submits a weekly report to Instructor and Supervisor will send his/her evaluation of the intern to Instructor at the end of the program.

8. FORMAT AND ACTIVITIES IN THE COURSE:

First an arrangement will be made between Instructor, Student and Supervisor of the site of internship program. Student will submit "CONTRACT" form to obtain necessary signature of instructor, academic administrators of UOG as well as Supervisor of the intern program. After specific objectives of the program are determined for the internship program, student will report and work under supervision of representatives at the site of the program. Student performance will be assessed by his/her attendance and quality of work evaluated by Supervisor. Instructor will review a weekly report from Student via e-mail and provide feedback to Student.

9. TEXT BOOKS/REFERENCES:

Text books/references will be assigned during the internship program.

10. ADDITIONAL MATERIALS OR EQUIPMENT:

Additional materials for this course will be given during the course when needed.

11. ASSIGNMENTS, TERM PAPERS AND EXAMS:

a. Attendance to the program
b. Active participation in the program
c. A weekly report of activities to Instructor
d. Outline and summary of the assigned projects and the entire program

12. EVALUATION AND GRADES:

Grade: A >= 90 %
B 80 – 89 %
C 70 - 79 %
D 60 - 69 %
F below 59 %

13. COURSE POLICIES:

Attendance is **required**. Submission of reports must be done on time.

14. SPECIAL NEEDS:

"If you are a student with a disability who will require a accommodation(s) to participate in this course, please contact me or the Institutional Compliance Officer privately to discuss your specific needs. You will need to provide me with documentation concerning your need for accommodation(s) from the EEO/ADA and TITLE IX Office. If you have not registered with the EEO/ADA and Title IX Office, you should do so immediately at 735-2244, (TTY) 735-2243 to coordinate your accommodation request."

15. CALENDAR OR SCHEDULE:

Part I. Introduction of the internship program
Part II. Performance of the internship activities and submission of a weekly report to Instructor
Part III. Evaluation of student's performance by Supervisor at the internship site
Part IV. Final grade for student performance

16. DROP DATES:

Students are required to follow the posted UOG policy found in the catalog. In general a student can withdraw from a course "voluntarily," without notifying the instructor, until mid October. Under certain circumstances a student can withdraw from classes as late as the end of the semester.

17. STUDENT WORK LOAD:

This course accounts for 1-3 credit hours, which consists of 40-hour work per credit.

18. SUPPLEMENTARY MATERIALS/ADDITIONAL RESOURCES:

Supplementary materials/additional resources for this course will be given during the internship program when needed.

19. CONTACT INFORMATION FOR CLASSMATES:

Not relevant

UNIVERSITY OF GUAM
UNIBETSET GUAHAN

COLLEGE OF NATURAL & APPLIED SCIENCES
Sustainable Agriculture, Food and Natural Resources Graduate Program

AL698 STUDENT CONTRACT

AL698 INTERNSHIP IN SUSTAINABLE AGRICULTURE, FOOD AND NATURAL RESORCES GRADUTE PROGRAM

I. THE STUDENT AGREES TO:

Adhere to the **course outline** described in the AL698 Special Project Application form.

Develop, in conjunction with the representative of *(Name of Internship Site)* and ***submit*** to the Instructor, by the end of the first week of the internship program: a list of objectives and a schedule of pertinent activities of the intern program.

Notify the Instructor within forty-eight (48) hours of any change in schedule and of any problems that will affect the performance of the Student's internship.

Send e-mail reports summarizing weekly activities to the Instructor and to the representative of *(Name of Internship Site)* during the internship program.

Accept the following conditions of internship:

A. WAIVER. In consideration of the educational benefits to be received by the Student from *(Name of Internship Site)* under the internship training, the student and his/her heirs, legal representatives and assigns, covenant to never institute any claim, suit, or action at law or equity against *(Name of Internship Site)* and their employees and agents by reason of any claim the student may now have or may hereafter acquire relating to accident, injury or damage of any kind, arising in the course of the internship training as described in this agreement. The student expressly reserves any and all rights, causes of action, claims and demands against any person, firm, or corporation other than *(Name of Internship Site)* and their employees and agents.

B. NONATTENDANCE. The student acknowledges notice that regular attendance during the assigned hours with *(Name of Internship Site)* is expected. At least twenty-four (24) hours advance notice must be given to the supervisor of *(Name of Internship Site)*, in the event of student will be absent. Three (3) unexcused absences will result in consideration by *(Name of Internship Site)* and Instructor to drop the student from the course. Hours of an excused absence must be rescheduled within one (1) week of the absence. Otherwise, the absence will be counted as an unexcused absence.

C. WITHDRAWALS. In the event the student withdraws from the course, the student in writing will promptly inform *(Name of Internship Site)*.

II. THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT:

1. "Student": the student duly enrolled in AL698 Internship in Sustainable Agriculture, Food and Natural Resources Graduate Program, College of Natural and Applied Sciences, University of Guam whose signature is affixed to the agreement herein.

2. "Instructor ": _____, Instructor to offer AL698 Internship course in Sustainable Agriculture, Food and Natural Resources Graduate Program, College of Natural and Applied Sciences, University of Guam.

III. SIGNATURES:

_____ Date:_____
Student,
Sustainable Agriculture, Food and Natural Resources Graduate Program

_____ Date:_____
Instructor,
Sustainable Agriculture, Food and Natural Resources Graduate Program

_____ Date:_____
Student's Advisor,
Sustainable Agriculture, Food and Natural Resources Graduate Program

_____ Date:_____
Chair,
Sustainable Agriculture, Food and Natural Resources Graduate Program

_____ Date:_____
Dean,
College of Natural and Applied Sciences, University of Guam

_____ Date:_____
Supervisor, _____(*Name of Internship Site*)_____

Log # 5277 h

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Sustainable Animal Production Systems
2. Catalog Number: AL 570 (New course may not duplicate active or inactive course number.)
3. Course Type: [X] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,…94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X] Graduate (/G) [ ] Both
5. Credit Hours: 3
6. Is this course cross-listed with another department? NO
   If so, list the cross-listed catalog number (s)? _____
7. What session(s) will the course be offered? [ ] Fall [X] Spring [ ] Summer [ ] All
8. What will be the yearly cycle for this course?
   [X] All Years [ ] Even Years [ ] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SPRING 2016 Length of Instruction (Weeks): Semester
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B.

Prerequisites Catalog #	Prerequisite Course Title
Bl 157/157L	Principles of Biology I
CF 230	Nutrition and Health

    C. Additional Prerequisites: _____
11. CATALOG DESCRIPTION: Use complete sentences and present tense.

Log # 5277 h

12. This course covers farm animal products and provides a general overview of the livestock and poultry industry, relative to biological concepts such as genetics, nutrition, reproduction and disease prevention. This includes biotechnology along with environmental challenges.

13. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

Online Journals available: Journal of Animal Science; Journal of Dairy Science; Poultry Science Journal.

14. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE

To meet requirement of new Master's Program Track on Sustainable Agriculture and Natural Resources.

15. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PROJECTED SIZE.

Class size will vary from five to twenty five as the program is expected to grow rapidly in the next five years.

16. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

CNAS faculty including adjunct faculty are available.

17. ADDITIONAL INFORMATION:

None

18. ATTACH COURSE OUTLINE:

See attached.

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		
Administrative Chair		4-5- 2013
Chair, College AAC/CC		5/13/13

Log # 5277 h

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

Dean, of College		2/16/15
UCRC/GCRC		
President, Faculty Senate (if substantive)	(Endorsement of UCRC/GCRC Recommendation)	

APPROVED:

SENIOR VICE PRESIDENT
ACADEMIC & STUDENT AFFAIRS

DATE

Log # 5277 h

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

NEW COURSE OUTLINE FORM

College: CNAS Course Number: AL 570

Course Title: Sustainable Animal Production Systems Credit Hours: 3.0

Date of Final Approval: _____ Semester Offered: Spring

Course counts as:
_____ general education requirement
__X__ part of CNAS Master Degree major program
_____ elective

1. Catalog Description:

This course covers farm animal products and provides a general overview of the livestock and poultry industry, relative to biological concepts such as genetics, nutrition, reproduction and disease prevention. This includes biotechnology along with environmental challenges.

2. Course Content:

Contents:

1. Animal Contributions to Human Needs
   a. Food and Clothing
   b. Work
   c. Companionship and Recreation
   d. Human Health Research
2. Animal Products and By-Products
   a. Red Meats
   b. Dairy products
   c. Poultry and Eggs
   d. Market Classes and Grades
3. Animal Reproduction and Artificial Insemination
   a. Female and Male Organs
   b. Semen Collection and Processing
   c. Estrous Synchronization

   d. Insemination and Embryo Transfer
4. Animal Genetics
   a. Genes and Chromosomes
   b. Production of Gametes
   c. Fertilization
   d. Types of Mating and Selection
   e. Animal Breeds and Breeding
5. Animal Nutrition
   a. Nutrients and Their Functions
   b. Feeds and Feed Composition
   c. Feed Formulation
6. Animal Health
   a. Environmental Effects on Animal Health
   b. Disease Prevention
   c. Major diseases of Farm Animals
7. Farm Animal Management and Feeding
   a. Beef Cattle
   b. Dairy Cattle
   c. Swine
   d. Poultry
8. Animal Biotechnology and Environmental Issues

3. Rationale for the Course:

   This course is designed to introduce the concept of food and agriculture biosecurity and provide a scientific base for sustainability in animal food production.

4. Skills and Background Required or Expected:

   Prerequisites for AL 570 are: Bl 157/157L and CF 230. The material will be taught with understanding that the student has a good knowledge of general biology and nutrition.

5. Teaching Methodologies and Anticipated class size:

   Lecture, farm visit and guest speakers will be incorporated, along with videos and class discussions. Maximum class size is 25.

6. Learning Objectives for Students:

At the end of this course, the student should be able to:

- Measure the contribution of animals to food biosecurity
- Identify the different sectors of livestock and poultry production
- Apply the nutritional requirements of livestock and poultry
- Analyze the contribution of reproductive physiology and genetics on animal production
- Assess the impact of environmental factors on animal health and welfare
- Apply good management practices for farm animals
- Explore the implications of biotechnologies on food biosecurity
- To assess the viability of sustainable farming on Guam and Micronesia

7. Methods of Evaluation

Tests (4): 50%
Quizzes: 25%
Projects: 25%

8. Methods for Student Learning Outcomes Assessment:

Provide grading rubric for projects
Provide review sessions for tests
Comprehensive final exam

9. Required and Recommended Texts or Study Guides:

Taylor, Robert E. and Field, Thomas G., (2011). Scientific Farm Animal Production: An Introduction to Animal Science, 10th Ed. Prentice Hall (ISBN-10: 0135111498; ISBN-13: 978-0135111499)

Suggested Supplemental Readings:

Cunningham, Merle, Latour, Mickey A. and Acker, Duane, (2011). Animal Science and Industry, 8th Ed. Prentice Hall College Division (ISBN-10: 0135025273)

Campbell, John R., Kenealy, Douglas M. and Campbell, Karen L., (2010). Animal Sciences: The Biology, Care and Production of Domestic Animals, 4th Ed. Waveland Pr. Inc. (ISBN-10: 1577666569)

10. Subsequent Courses:

None

11. Additional Course Descriptors, if any:

None

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

_____Approved _____Disapproved _____ _____
Senior Vice President, Academic & Student Affairs Date

Log # 5277 h

UNIVERSITY OF GUAM

College of Natural & Applied Sciences

AL 570 Sustainable Animal Production Systems

Course Syllabus

INSTRUCTOR

Hauhouot Diambra Odi, Ph.D., Adjunct Professor of Animal Science and Nutrition

Office: N/A

Phone:

Fax:

E-mail: hdiambraodi@gmail.com

Office Hours: TBA

CATALOG DESCRIPTION

This course covers farm animal products and provides a general overview of the livestock and poultry industry, relative to biological concepts such as genetics, nutrition, reproduction and disease prevention. This includes biotechnology along with environmental challenges.

RATIONALE FOR THE COURSE

This course is designed to introduce the concept of food and agricultural biosecurity and provide a scientific base for sustainability with animal products and by-products.

COURSE FORMAT

Lecture, farm visit and guest speakers will be incorporated, along with videos and class discussions.

REQUIRED TEXTBOOK

Taylor, Robert E. and Field, Thomas G., (2011). Scientific Farm Animal Production: An Introduction to Animal Science, 10th Ed. Prentice Hall (ISBN-10: 0135111498; ISBN-13: 978-0135111499)

LEARNING OBJECTIVES

As a result of taking this course, the student should be able to:

- Analyze the contribution of animals to food biosecurity
- Identify the different sectors of livestock and poultry production
- Apply the nutritional requirements of livestock and poultry to feeding practices
- Recognize the contribution of reproductive physiology and genetics on animal production
- Assess the impact of environmental factors on animal health and welfare
- Identify different management practices for farm animals
- Explore the implications of biotechnologies on food biosecurity
- Assess the viability of sustainable farming on Guam and Micronesia

COURSE POLICIES

Professional and ethical conduct is expected at all times. During the course of the semester, four tests and eight quizzes will be administered. Make-up tests will not be given. Two projects will be assigned. All assignments are due the day noted in the calendar on the syllabus. No late assignment will be accepted. As a courtesy to the instructor and your classmates, please arrive on time and turn off or put on silent mode all electronic devices. Please do not bring children to class.

UOG DISABILITY POLICY

Please visit www.uog.edu/eeo/PolicyDisability.pdf for more information on UOG disability policy.

SPECIAL NEEDS (EEO/ADA)

Accommodation request for special needs are to be addressed at the EEO/ADA office at 735-2243/4.

GRADING SYSTEM/EVALUATION METHODOLOGIES

- Tests (4) 50%
- Quizzes (8) 25%
- Projects (2) 25%

COURSE DESCRIPTION

Contents:

1. Animal Contributions to Human Needs
    a. Food and Clothing
    b. Work
    c. Companionship and Recreation
    d. Human Health Research
2. Animal Products and By-Products
    a. Red Meats
    b. Dairy products
    c. Poultry and Eggs
    d. Market Classes and Grades
3. Animal Reproduction and Artificial Insemination
    a. Female and Male Organs
    b. Semen Collection and Processing
    c. Estrous Synchronization
    d. Insemination and Embryo Transfer
4. Animal Genetics
    a. Genes and Chromosomes
    b. Production of Gametes
    c. Fertilization
    d. Types of Mating and Selection
    e. Animal Breeds and Breeding
5. Animal Nutrition
    a. Nutrients and Their Functions
    b. Feeds and Feed Composition
    c. Feed Formulation
6. Animal Health
    a. Environmental Effects on Animal Health
    b. Disease Prevention
    c. Major diseases of Farm Animals
7. Farm Animal Management and Feeding
    a. Beef Cattle

b. Dairy Cattle
c. Swine
d. Poultry

8. Animal Biotechnology and Environmental Issues

WITHDRAWAL DATES

The deadline for voluntary withdrawal is determined by the UOG Records Office. Please check the deadline for the given semester.

SUGGESTED SUPPLEMENTAL READINGS

Merle Cunningham, Mickey A. Latour and Duane Acker (2011). Animal Science and Industry. Prentice Hall College Division; 8th Ed. ISBN-10: 0135025273

John R. Campbell, M. Douglass Kenaealy and Karen L. Campbell (2010). Animal Sciences: The Biology, Care and Production of Domestic Animals. Waveland Pr. Inc; 4th Ed. ISBN-10: 1577666569

Faculty Senate Office
University of Guam
Received By: Lm
11/15/2016 12:20 pm
Date & Time

No. 527;

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Seminar and Current Topics
2. Catalog Number: AL 691__ (New course may not duplicate active or inactive course number.)
3. Course Type: [X] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,...94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X] Graduate (/G) [ ] Both
5. Credit Hours: 1
6. Is this course cross-listed with another department? No
   If so, list the cross-listed catalog number (s)? _____
7. What session(s) will the course be offered? [ ] Fall [X] Spring [ ] Summer [ ] All
8. What will be the yearly cycle for this course?
   [X] All Years [ ] Even Years [ ] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SP 2016 Length of Instruction (Weeks): 15
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B. Prerequisites Catalog # Prerequisite Course Title
    C. Additional Prerequisites: _____
11. CATALOG DESCRIPTION: Use complete sentences and present tense.

11. CATALOG DESCRIPTION: Use complete sentences and present tense.

This course is graduate seminar course that combines formal student presentations with invited presentations by faculty and community members involved with agriculture and life sciences and related subjects. The course consists of 1-hour sessions each week throughout the semester.

12. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

13. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE

14. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PRJECTED SIZE.

15. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

16. ADDITIONAL INFORMATION:

17. ATTACH COURSE OUTLINE:

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		
Administrative Chair		4-5-2013
Chair, College AAC/CC		5/13/13
Dean, of College		2/6/15
UCRC / GCRC		12 Dec 2014
President, Faculty Senate (if substantive)	Endorsement of UCRC GCRC Recommendation	2 Dec 2016

APPROVED:

SENIOR VICE PRESIDENT ACADEMIC & STUDENT AFFAIRS

12-13-2016
DATE

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

NEW COURSE OUTLINE FORM

College: College of Natural & Applied Sciences

Course Number: AG 691

Course Title: Seminar and Current Topics

Credit Hours: 1

Date of Final Approval: _____

Semester Offered: SP

Course counts as:

_____ general education requirement

__X__ part of MS Agriculture, Food and Natural Resources major program

_____ elective

1. Catalog Description:
   This course is a graduate seminar course that combines formal student presentations with invited faculty and community members involved in agriculture and life sciences and related subjects. The course consists of one hour session each week throughout the semester.

2. Course Content:
   Topics will be selected according to student interests and current trends in the profession.

3. Rationale for the Course:
   Seminar and Current Topics brings together students and professionals while addressing new trends in the area of agriculture, food and natural resources.

4. Skills and Background Required or Expected:
   This course is aimed at developing oral and presentation skills, as well as critical skills throughout discussions.

5. Teaching Methodologies and Anticipated class size:
   Teaching methods will include power point presentations, video, posters and discussions. Anticipated class size is ten.

6. Learning Objectives for Students:
   - Apply content knowledge to specific topics related to agriculture, food and natural resources
   - Develop and apply critical skills in discussions
   - Apply communication skills in different forms of presentation
   - Conduct literature reviews and report from credentialed sources

7. Methods of Evaluation

Student's attendance:	15%
Written Test/Quiz:	10%
Presentation Outline/Abstract:	10%
Presentation (oral or poster)	40%
Project/Written Report:	25%
Total:	100%

8. Methods for Student Learning Outcomes Assessment:
   Preparation of grading rubric for presentation and class participation

9. Required and Recommended Texts or Study Guides:
   No required textbook

10. Subsequent Courses:
    None

11. Additional Course Descriptors, if any:
    None

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

✓ Approved _____ Disapproved

Senior Vice President, Academic & Student Affairs

12-13-2016
Date

AL 691: Seminar in Agriculture and Life Science
Course Syllabus
Spring 2013

Instructor: Mohammad H. Golabi, Ph.D.
Associate Professor of Soil and Environmental Sciences
Office: Room 302 CNAS
Office Hours: Thurs: 11am- 12 noon, Office Phone: 735-2134
Email: mgolabi@guam.uog.edu

Class meets at: 12:00 noon – 1:00 pm every Thursday in Room 104, CNAS

Course Description: This course is graduate seminar course that combines formal student presentations with invited presentations by faculty and community members involved with agriculture and life sciences and related subjects. The course consists of 1-hour sessions each week throughout the semester.

Objectives: The aim of the seminar is to teach the student how to organize and conduct a scientific seminar equivalent to seminars conducted at the national and international conferences and symposiums. Also to familiarize each student to current topics in environmental and agricultural sciences by searching relative topics as well as listening to guest presentations from faculty and local researchers and also by reading current scientific literature (topic may or may not relate to their own thesis), and by making formal presentations.

Classroom Format: Student should already have learned the basic skill of report writings and preparation taught in technical writing classes offered at the University. In this course (AL691) however the students will participate in discussions on some of the basic skills that was learned previously through lecture notes also they will have the opportunity to listen to presenters invited from the faculty pool and other researches whose works are related to agriculture and life sciences. Students also will be required to select articles in scientific journals relating to agriculture and life sciences and/or prepare a presentation from a project that he or she is already working on as a thesis project. Students must prepare an outline to include the topic(s) of his her presentation that summarizes the subject. Students can present their presentations with a format that they see the best fit for their topic (i.e., Power point presentation, Poster presentation, etc). Poster Presentations will be presented in class during allocated time period and they also may be displayed in the college halls for a specific time period (if they are produced neatly) following the formal presentation. Depending on how many topics students will choose and the time availability, students may present more than one formal seminars/poster presentations on environmental and agricultural science topics of their choice. Following an initial presentation of 25 minutes, the student will lead class discussion and respond to questions.

Course Requirements:
The major course requirement for this class is student participation in all the seminars. student's seminar presentation, final project reports, and other related requirements (i.e., project outline, quizzes, etc) as listed in the course grading criteria.

Grading Criteria:

Student's attendance:	15%
Written test/quiz:	10%
Presentation outline/Presentation abstract:	10%
Presentations (oral or poster):	40%
Project/Presentation Written Report	25%
Total	100%

Student presentations will be evaluated by each class member as well as the instructor on a scale of 0-100 with brief written comments on a summary sheet. Scores will be averaged and grades assigned as follows:

Grading Categories

A	90% 100%
B	80-89%
C	70-79%
D	< 70%

Note: No 'F' is listed, provided that student attend all the classes (instructor should be notified for the excusable absents). Attendance will carry 15% of total grades. Students missing more than 3 seminar sessions will receive a grade reduction of one letter grade.

POLICY NOTES

Note 1: If you are a student with a disability who will require an accommodation (s) to participate in this course, please contact me privately to discuss your specific needs. You will need to provide me with documentation concerning your need for accommodations(s) from the EEO ADA offices. If you have not registered with the EEO ADA offices, you should do so immediately at 735 – 2244 2971 2243 (TTY) to coordinate your accommodation request.

UNIVERSITY OF GUAM
College of Natural & Applied Sciences
AL698 Credit Hour: 1-3
Semester Offered: Fall, Spring, Summer

COURSE SYLLABUS

1. INSTRUCTOR Staff
CLASS HOUR: TBA
CLASS ROOM: TBA

2. CATALOG COURSE DESCRIPTION:
The internship program provides students with opportunities to work in the academic and professional areas of their interest under the supervision of the expert in the field. For the internship course, a "AL698 Student Contract Form" needs to be signed by Student, Course Instructor, Student's Advisor, the Chair of the graduate program, The Dean of the college, and Supervisor of the participating party such as another academic institution, a government agency, a private business, or a non-profit organization engaged in activities that relate to sustainable agriculture, food, nutrition, and natural resources. Each credit requires 40 hours of job training per semester and the 3-credit internship course requires 120 hours. Student may take up to a maximum of six credit hours for completion of the program.

3. COURSE CONTENT:
Student and Supervisor of the participating party will develop a list of objectives and a schedule of activities of the internship program. By the end of first week of the internship program, the program plan must be submitted to Instructor. Student will report to work at job/work site to perform scheduled activities. Weekly report of activities will submit to Instructor. Supervisor will provide his/her evaluation of student activities to Instructor who will give a grade.

4. RATIONAL FOR OFFERING THE COURSE:
Internship program will provide students with opportunities to work under the supervision of an expert in the field of their interest. Experience obtained from the internship program will enhance and excel student knowledge of the field.

5. SKILLS AND BACKGROUND REQUIRED OR EXPECTED:
Communication skills are required to interact with the supervisor and submit reports to the instructor. Some knowledge is required in the areas of agriculture, biology, chemistry, environmental science, natural sciences, and the subjects of the field of internship program.

6. LEARNING OBJECTIVES FOR STUDENTS (INTENDED STUDENT LEARNING OUTCOMES - SLOs):

The main objective of this course is to recognize and obtain specialized skills in sustainable agriculture, food and natural resources from experts in the field.

Specific Learning Outcomes (SLOs)
After completion of the course, students will be able to:

a. list assigned work at the site of the internship program
b. summarize and analyze findings of assigned projects
c. present these findings and accomplishments in writing and orally.

7. CONCEPTUAL STRUCTURE OF THE COURSE:

Student will perform activities at off-campus site under supervision of a representative of an internship program. Student submits a weekly report to Instructor and Supervisor will send his/her evaluation of the intern to Instructor at the end of the program.

8. FORMAT AND ACTIVITIES IN THE COURSE:

First an arrangement will be made between Instructor, Student and Supervisor of the site of internship program. Student will submit "CONTRACT" form to obtain necessary signature of instructor, academic administrators of UOG as well as Supervisor of the intern program. After specific objectives of the program are determined for the internship program, student will report and work under supervision of representatives at the site of the program. Student performance will be assessed by his/her attendance and quality of work evaluated by Supervisor. Instructor will review a weekly report from Student via e-mail and provide feedback to Student.

9. TEXT BOOKS/REFERENCES:

Text books/references will be assigned during the internship program.

10. ADDITIONAL MATERIALS OR EQUIPMENT:

Additional materials for this course will be given during the course when needed.

11. ASSIGNMENTS, TERM PAPERS AND EXAMS:

a. Attendance to the program
b. Active participation in the program
c. A weekly report of activities to Instructor
d. Outline and summary of the assigned projects and the entire program

12. EVALUATION AND GRADES:

Grade: A >= 90 %
B 80 – 89 %
C 70 - 79 %
D 60 - 69 %
F below 59 %

13. COURSE POLICIES:

Attendance is **required**. Submission of reports must be done on time.

14. SPECIAL NEEDS:

"If you are a student with a disability who will require a accommodation(s) to participate in this course, please contact me or the Institutional Compliance Officer privately to discuss your specific needs. You will need to provide me with documentation concerning your need for accommodation(s) from the EEO/ADA and TITLE IX Office. If you have not registered with the EEO/ADA and Title IX Office, you should do so immediately at 735-2244, (TTY) 735-2243 to coordinate your accommodation request."

15. CALENDAR OR SCHEDULE:

Part I. Introduction of the internship program
Part II. Performance of the internship activities and submission of a weekly report to Instructor
Part III. Evaluation of student's performance by Supervisor at the internship site
Part IV. Final grade for student performance

16. DROP DATES:

Students are required to follow the posted UOG policy found in the catalog. In general a student can withdraw from a course "voluntarily," without notifying the instructor, until mid October. Under certain circumstances a student can withdraw from classes as late as the end of the semester.

17. STUDENT WORK LOAD:

This course accounts for 1-3 credit hours, which consists of 40-hour work per credit.

18. SUPPLEMENTARY MATERIALS/ADDITIONAL RESOURCES:

Supplementary materials/additional resources for this course will be given during the internship program when needed.

19. CONTACT INFORMATION FOR CLASSMATES:

Not relevant

AL 691: AGRICULTURE AND LIFE SCIENCE SEMINAR

Schedules for Class Lectures/Presentations

Date	Topic	Presenter
January	Syllabus Review	Golabi
January	Introduction to Seminar preparation	Golabi
February	Introduction to Seminar preparation	Golabi
February	Introduction to Seminar preparation	Golabi
February	Introduction to Seminar preparation	Golabi
March		Guest Presenter
March		Guest Presenter
March		Guest Presenter
March		Guest Presenter
April		Guest Presenter
April		Guest Presenter
April		Student Presenter
April		Student Presenter
May		Student Presenter
May		Student Presenter
May		Student Presenter
May		Student Presenter

Faculty Senate Office
University of Guam
Received By:
11/15/2016 12:20 pm
Date & Time

No. 5277k

UNIVERSITY OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

REQUEST FOR NEW COURSE

1. Title: Principle of Plant Nutrition
2. Catalog Number: AL 581 (New course may not duplicate active or inactive course number.)
3. Course Type: [X] Addition to the Curriculum
   [ ] Special Needs (Workshop, seminar, special topic,…94 series, etc.)
4. Level of Instruction: [ ] Undergraduate [X] Graduate (/G) [ ] Both
5. Credit Hours: 3
6. Is this course cross-listed with another department? NO
   If so, list the cross-listed catalog number (s)? _____
7. What session(s) will the course be offered? [ ] Fall [X] Spring [ ] Summer [ ] All
8. What will be the yearly cycle for this course?
   [X] All Years [ ] Even Years [ ] Odd Years [ ] One (1) Term Only
9. First term and year for this course: SPRING 2016 Length of Instruction (Weeks): Semester
10. Prerequisites:
    A. Instructor / Advisor consent required? [ ] Yes [X] No
    B. Prerequisites Catalog # Prerequisite Course Title

Prerequisites Catalog #	Prerequisite Course Title
CH 102	General Chemistry
CH 103	General Chemistry

    C. Additional Prerequisites: _____
11. CATALOG DESCRIPTION: Use complete sentences and present tense.

12. As the world's population increases, there is a worldwide need to produce higher quality/ higher yielding crops which only can be achieved if plant nutrition needs are met in sufficient amounts and in timely manners. It is the aim of this course therefore, to present "Principles of Plant Nutrition" which may be applied in the production of more and better food and plant products (Mengel and Kirby, 1982). Hence the main purpose of this course is to provide lessons to the students to be able to apply crop production practices to help solve food shortage in their communities.

13. DESCRIBE LIBRARY AND INFORMATION TECHNOLOGY RESOURCES AVAILABLE TO SUPPORT COURSE: If insufficient library sources are available, describe alternatives that will be used.

Online Journals available: Journal of Agronomy; Journal of Plant Nutrition.

14. SUBSTANTIATE THE COMPELLING NEED FOR THE NEW COURSE

To meet requirement of new Master's Program Track on Agriculture and Natural Resources.

15. WHAT IS THE ANTICIPATED CLASS SIZE AND DOCUMENT INDICATIONS ON HOW THE NEW COURSE WILL MEET ITS PROJECTED SIZE.

Class size will vary from five to twenty five as the program is expected to grow rapidly in the next five years.

16. STATE HOW THE NEW COURSE WILL BE COVERED BY EXISTING PROGRAM FACULTY.

CNAS faculty including adjunct faculty are available.

17. ADDITIONAL INFORMATION:

None

18. ATTACH COURSE OUTLINE:

See attached.

APPROVAL RECOMMENDED BY:

UNIT	SIGNATURE (use BLUE pen please)	DATE
For Program		

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

Administrative Chair		4-5-2013
Chair, College AAC/CC		5/13/13
Dean, of College		2/16/16
UCRC/GCRC		12 Dec 2016
President, Faculty Senate (if substantive)	Kathy Moore (Endorsement of UCRC/GCRC Recommendation)	2 Dec 2016

APPROVED:

SENIOR VICE PRESIDENT
ACADEMIC & STUDENT AFFAIRS

12-13-2016
DATE

UNIVERSITY
OF GUAM
Unibetsedåt GUAHAN

Office of Academic and Student Affairs

NEW COURSE OUTLINE FORM

College: CNAS Course Number: AL 581

Course Title: Principles of Plant Nutrition Credit Hours: 3.0

Date of Final Approval: _____ Semester Offered: ~~Spring~~

Course counts as:
_____ general education requirement
__X__ part of CNAS Master Degree major program
_____ elective

1. Catalog Description:

This course covers plant metabolism and the assimilation of nutrients, their functions in plant and their contributions to plant growth and crop production. The course presents a wide range of topics which cut across the boundaries of soil sciences, plant physiology and biochemistry, as well as some of the ecological conditions pertaining to the tropical and humid environments.

2. Course Content:

Contents:

1. Plant Nutrients
    a. Definition and Classification
    b. General Plant Nutrient Functions in the Plant
    c. Mineral Content of plant Material
2. The Soil as a Plant Nutrient Medium
    a. Soil Physico-Chemical Properties
    b. Factors Relating to Plant Nutrient in the Soil
    c. Determination of Nutrient Availability
3. Nutrient Uptake and Assimilation
    a. Ion Uptake and Ionic Status of Plants
    b. Photosynthesis and CO_2 Assimilation
    c. Nitrogen and Sulfur Assimilation
4. Plant-Water Relationships

a. Basic processes in Plant-Water Relationships
b. Water Balance
c. Long Distance Transport
d. Physiological Aspects of Water Stress
e. Practical Aspects of Water Stress
f. Salinity

5. Nutrition and Plant Growth
   a. Essential Growth Stages and Yield Components
   b. Nutrition and Yield response
   c. Nutrition and Plant Quality
6. Fertilizer Applications
   a. Nutrient Cycling
   b. Mineral Fertilizers, Manures and Organic Fertilizers (Compost)
   c. Fertilizer Application Techniques and Methods
7. Nitrogen
   a. Nitrogen in the Soil and its Availability
   b. Nitrogen in Plant Physiology
   c. Nitrogen in Crop Nutrition
   d. Nitrogen Fertilizer Application and Crop Production
8. Sulfur
   a. Soil Sulfur
   b. Sulfur in Plant Physiology
   c. Sulfur in Crop Nutrition
9. Phosphorus
   a. Soil Phosphorus
   b. P in Plant Physiology
   c. P in Crop Nutrition
10. Potassium
   a. Soil Potassium
   b. K in Plant Physiology
   c. K in Crop Nutrition
11. Calcium
   a. Soil Calcium
   b. Ca in Plant Physiology
   c. Ca in Crop Nutrition
12. Magnesium
   a. Soil Magnesium
   b. Mg in Plant Physiology
   c. Mg in Crop Nutrition
13. Iron
   a. Soil Iron
   b. Fe in Plant Physiology
   c. Fe in Crop Nutrition

14. Manganese
    a. Soil Manganese
    b. Mn in Plant Physiology
    c. Mn in Crop Nutrition
15. Zinc
    a. Soil Zinc
    b. Zn in Plant Physiology
    c. Zn in Crop Nutrition
16. Copper
    a. Soil Copper
    b. Cu in Plant Physiology
    c. Cu in Crop Nutrition
17. Molybdenum
    a. Soil Molybdenum
    b. Mo in Plant Physiology
    c. Mo in Crop Nutrition
18. Boron
    a. Soil Boron
    b. B in Plant Physiology
    c. B in Crop Nutrition
19. Other Elements of Importance
    a. Chlorine
    b. Silicon
    c. Cobalt
    d. Vanadium
20. Elements with Toxic Effects (I, Br, F, Al, Ni, Cr, Se, Pb, Cd)
21. Soil Properties and Processes Affecting Nutrient Availability
    a. Clay charges
    b. Ion exchange
    c. Adsorption

3. Rationale for the Course:

This course is designed to introduce the concept of sustainable agriculture and is designed to provide a better understanding of plant nutrition in general, and the contribution of organic fertilizer and composting on plant growth.

4. Skills and Background Required or Expected:

   Prerequisites for AL 581 is CH 102 and CH 103, or consent of the instructor.

5. Teaching Methodologies and Anticipated class size:

   Lecture with active participation of students. Maximum class size is 25.

6. Learning Objectives for Students:

   At the end of this course, the student should be able to:

   - Analyze the roles of nutrients in plant growth and the mechanisms of plant nutrient uptake
   - Identify nutrient management practices, including the use of fertilizers and soil amendments that maximizes plant nutrient uptake hence plant health and higher crop productivity
   - Compare the role of plant nutrients in plant growth and the processes affecting nutrient utilization and nutrient distribution in the plant
   - Measure how soil chemicals, biological and physical factors interact to affect the soil as a medium for plant growth

7. Methods of Evaluation

Two midterm exams (15% each)	30%
Final Exam (comprehensive)	30%
Homework	15%
Term Paper	15%
Class Attendance	10%

Grading Breakdown

90-100%	A
80-89%	B
70-79%	C
60-69%	D

8. Methods for Student Learning Outcomes Assessment:

   Provide grading rubric for projects
   Provide review sessions for tests
   Comprehensive final exam

9. Required and Recommended Texts or Study Guides:

   K. Mengel and E. A. Kirby. 1982. Principles of Plant Nutrition. 3rd Ed.

   Suggested Supplemental Readings:

S. Tisdale, W. nelson and J. Beaton. 1985. Soil Fertility and Fertilizers. 4th Ed. MacMillan Publishing Company, New York

P.A. Sanches. 1976. Properties and Management of Soils in the Tropics.

10. Subsequent Courses:

None

11. Additional Course Descriptors, if any:

None

The Calendar of Assignments, Assessment Project, a Statement Concerning the "Americans with Disabilities Act" (ADA) Accommodations for Students, Attendance and Grading Policies are to be included in the course syllabus.

✓ Approved _____ Disapproved

Senior Vice President, Academic & Student Affairs

12-13-2016
Date

AG 594 – Principles of Plant Nutrition

COURSE SYLLABUS/OUTLINES

Fall Semester (even years)

Instructor: Mohammad Golabi, PhD
Associate Professor of Soil and Environmental Sciences
Office telephone number: 735-2134/2143
Email: mgolabi@uguam.uog.edu

Class Schedules: 10:30am – 11:50am Tuesdays and Thursdays
Classroom: CNAS 125b

Office hours: Tue, Th 1:00pm to 2:00pm - Room 302 CNAS

ABOUT THE COURSE:

COURSE DESCRIPTION AND PHILOSOPHY

Indisputably man and animal lives depend very much on plant life as a source of food, raw material and energy. This is mainly due to the ability of green plant that transforms light energy into chemical energy. In the process of photosynthesis, a very low concentration of carbon dioxide is captured and accumulated by plants hence converted into sugars. This is the basis for the synthesis of vital raw materials, including starch, fibers, vegetable oils, and gums, as well as many types of organic compounds some like essential amino acids, essential fatty acids and vitamins are indispensable in the mammalian diet. It is this photosynthetic process that accounts for the world's energy stores of fossil fuels on which man relies on heavily (Mengel and Kirkby, 1982). As world population increases, there is a worldwide need to produce higher quality/higher yielding crops which only can be achieved if plant nutrition needs are met in sufficient amounts and in timely manners. It is the aim of this course therefore, to present 'Principles of Plant Nutrition' which may be applied in the production of more and better food and plant products (Mengel and Kirkby, 1982). Hence the main purpose of this course is to provide lessons to the students whom someday could participate in crop production practices and help solve the problem of plant and crop shortage in their communities/world.

COURSE CONTENT:

The subject of plant nutrition is concerned with the provision of plants with nutrients as well as nutrient uptake and distribution in plants. Plant nutrition is very closely related to plant metabolism, hence the assimilation of nutrients, their functions in plant metabolism and their contributions to plant growth and eventually crop production in order to meet the world's demands for food and fiber. The practical side of plant nutrition is that it dictates the need for fertilizer application and in the broader sense it includes the principles and management of soil as a medium for plant growth and crop production. The course presents a wide spectrum of topics which cut across the boundaries of Soil Sciences, Plant Physiology and Biochemistry as well as some of the Ecological conditions pertaining to the tropical humid as they relate to plant types

and soil conditions and the soil management practices for optimum uptake of nutrients and distribution of nutrients in plants.

RATIONAL FOR THE COURSE

The philosophy of this course will therefore be to stimulate student's interest in plant nutrition and the availability of nutrients in the soil by providing an understanding of important principles and properties of soils in relation to plant growth focusing on the plant nutrient uptake and mechanisms of nutrient distribution in the plant. The course is designed to provide a better understanding of 'Plant Nutrition' and in a way that can be understood by students at graduate as well as undergraduate levels. This course is designed for students of Agriculture, Horticulture, and Forestry of the graduate and undergraduate programs.

SKILLS AND BACKGROUND KNOWLEDGE REQUIRED OR EXPECTED

Prerequisite courses: One to two courses in chemistry (CH102 and CH103), consent of the instructor. Students should also be competent in Math in order to be able to make basic Algebraic calculations.

TEACHING METHODS

The course will be thought through lectures in which the active participation of students will be promoted and stimulated.

LEARNING OBJECTIVES OF THE COURSE:

A. To understand the roles of nutrients in plant growth and the mechanisms of plant nutrient uptake.
B. To learn how soil chemical, biological, and physical factors interact to affect the soil as a medium for plant growth.
C. To understand the role of plant nutrients in plant growth and the processes affecting nutrient utilization and nutrient distribution in the plant.
D. To identify nutrient management practices, including the use of fertilizers and soil amendments that maximizes plant nutrient uptake hence plant health and higher crop productivity.

COURSE REQUIREMENTS AND RESOURCES:

Textbooks:

1. K. Mengel and E.A. Kirby. 1982. 3rd Ed. Principles of Plant Nutrition.

2. Samule Tisdale, Werner Nelson, and James Beaton. 1985. 4th ed., Soil Fertility and Fertilizers. MacMillan Publishing Company, New York, NY

3. Pedro A. Sanches 1976. Properties and Management of Soils in the Tropics.

METHODS OF EVALUATION

Methods of evaluation are based on: written exams, home works, laboratory reports as well as class attendance. **Class attendance is considered very important for this course and**

therefore students are advised to attend all lectures. Unless for emergencies and/or for medical reasons inexcusable absences are not acceptable in this course.

Also as part of the evaluation/assessment methods a background quiz (pre-test) will be given to the students to assess their background level of knowledge with respect to chemistry, math, and physics required for understanding the subject matters covered in this course as well for assessing the student's general understanding of soil sciences. In case of weakness, the instructor will review some of the relevant topics on those subjects during the first few lectures of this semester.

LECTURE TOPICS/COURSE OUTLINE

Review Material from the Introductory Soil and Plant Science topics

1. Plant Nutrients
    - A. Definition and Classification
    - B. General plant Nutrients Functions in the Plant
    - C. Mineral contents of plant Material
2. The Soil as a Plant Nutrient Medium
    - A. Soil physico-chemical properties
    - B. Factors relating to plant Nutrient in the Soil
    - C. Determination of Nutrient availability
3. Nutrient Uptake and Assimilation
    - A. Ion uptake and Ionic status of plants
    - B. Photosynthesis and CO_2 Assimilation
    - C. Nitrogen and Sulphur Assimilation
4. Plant Water Relationships
    - A. Basic processes in Plant/Water Relationships
    - B. Water Balance
    - C. Long Distance Transport
    - D. Physiological Aspects of Water Stress
    - E. Practical Aspects of Water Stress
    - F. Salinity
5. Nutrition and plant Growth
    - A. Essential Growth Stages and Yield Components
    - B. Nutrition and Yield Response
    - C. Nutrition and Plant Quality
6. Fertilizer Applications
    - A. Nutrient Cycling
    - B. Mineral Fertilizers, Manures and Organic fertilizers (Compost)
    - C. Fertilizer Application Techniques and Methods

MIDTERM EXAM 1: _____

Major Plant Nutrients and their Uptake and Metabolism in the plant

7. NITROGEN
   - A. Nitrogen in the Soil and its Availability
   - B. Nitrogen in Plant Physiology
   - C. Nitrogen in Crop Nutrition
   - D. Nitrogen Fertilizer Application and Crop Production

8. SULPHUR
   - A. Soil Sulphur
   - B. Sulphur in Plant Physiology
   - C. Sulphur in Crop Nutrition

9. PHOSPHORUS
   - A. Soil Phosphorus
   - B. Phosphorus in plant Physiology
   - C. Phosphorus in Crop Nutrition

10. POTASSIUM
   - A. Soil Potassium
   - B. Potassium in plant Physiology
   - C. Potassium in Crop Nutrition

11. CALCIUM
   - A. Soil Calcium
   - B. Calcium in Plant Physiology
   - C. Liming and Calcium in Crop Nutrition

12. MAGNESIUM
   - A. Soil Magnesium
   - B. Magnesium in Physiology
   - C. Magnesium in Crop Nutrition

13. IRON
   - A. Soil Iron
   - B. Iron in Plant Physiology
   - C. Iron in Crop Nutrition

14. MANGANESE
   - A. Soil Manganese
   - B. Manganese in Plant Physiology
   - C. Manganese in Crop Nutrition

15. ZINC
   - A. Soil Zinc
   - B. Zinc in Plant Physiology
   - C. Zinc in Crop Nutrition

16. COPPER
    A. Soil Copper
    B. Copper in Plant Physiology
    C. Copper in Crop Production

17. MOLYBDENUM
    A. Soil Molybdenum
    B. Molybdenum in Plant Physiology
    C. Molybdenum in Crop Production

18. BORON
    A. Soil boron
    B. Boron in Plant Physiology
    C. Boron in Crop Nutrition

MIDTERM EXAM 2: _____

19. OTHER ELEMENTS OF IMPORTANCE
    A. Chlorine
    B. Silicon
    C. Cobalt
    D. Vanadium

20. ELEMENTS WITH TOXIC EFFECTS
    A. Iodine
    B. Bromine
    C. Fluorine
    D. Aluminum
    E. Nickel
    F. Chromium
    G. Selenium
    H. Lead
    I. Cadmium

21. SOIL PROPERTIES AND PROCESSES AFFECTING NUTRIENT AVAILABILITY:
    A. Clay charges,
    B. Ion exchange and
    C. Adsorption

FINAL EXAM: _____

TERM PAPER: EXAMPLE TOPICS

- Soil Quality and Agricultural Sustainability
- Plant Growth and Soil Nutrients
- Nutrient Cycling and the Environment
- Use of composted organic waste as a source of plant nutrient for agricultural sustainability
- Issues related to production Agriculture and the Environment. How Agricultural activities and fertilizers (plant nutrition) applications can have an impact on the environment? How the Environment can impact the plant nutrition and agricultural productivity?
- Any other relevant topics

Grading and Evaluation categories are described hereafter:

GRADING CRITERIA:

Activity	% of Final Grade
Two midterm exams (15% each)	30
Final exam (comprehensive)	30
Homework	15
Term paper	15
Class attendance	10

Note: all students are required to write a term paper that counts 15% towards their final grade.

Grading Breakdown:

90-100 (%)	A
80-89 (%)	B
70-79 (%)	C
60-69 (%)	D

Note 1: As noted class attendance weighs considerably for grading the course.

Note 2: This syllabus is subject to revision and/or improvement throughout the semester. Also the sequence of the lectures may vary as discussions may lead from one topic to another and/or due to unexpected events (i.e., typhoon, etc.) and time limitations.

Note 3: If you are a student with a disability who will require special accommodations to participate in this course, please contact me privately to discuss your specific needs. You will need to provide me with documentation concerning your need for accommodations from the EEO/ADA offices. If you have not registered with the EEO/ADA offices, you should do so immediately at 735 – 2244/2971/2243 (TTY) to coordinate your accommodation request.

Appendix 6: Other Forms

UNIVERSITY OF GUAM
Graduate Studies, Sponsored Programs & Research
GRADUATE DEGREE PROGRAM
DEGREE: Master of Science (M.S.)
MAJOR: Sustainable Agriculture, Nutrition, and Natural Resources Management (SANNRM)

I. ADMISSION INFORMATION

1. **GPA** (Cumulative Undergraduate):_____

II. GENERAL INFORMATION

Name: _____ SS#: _____

Mailing Address: _____

Email: _____

Phone: Home: _____ Office: _____ Cell: _____

Undergraduate College Degree: _____

University: _____

III. PRE-CANDIDATE ADVISEMENT and REVIEW (Acknowledged by Student and Program Chair)

Student: _____ Date: _____

Program Chair: _____ Date: _____

IV. SPECIAL PROJECT/THESIS COMMITTEE MEMBERS (Please have Committee Members initial)

Chairperson: _____ Initial: _____
Name and Department

Members: 1: _____ Initial: _____
Name and Department

2: _____ Initial: _____
Name and Department

3: _____ Initial: _____
Name and Department (add, if needed)

NOTE: If the Chairperson and/or Committee Member finds that he or she cannot serve, particularly due to absence from the campus at the time the student is finishing his or her work, he or she must notify the Graduate Program Chair, Academic Dean and the Assistant Vice President of Graduate Studies so that a substitute can be appointed.

V. TRANSFER CREDITS

NOTE: A maximum of 9 semester credits can be transferred into a program (1 quarter hr. = 2/3 semester hours). Grades below "B" are not transferable as graduate credit.

COURSE	COLLEGE	GRADE	CREDIT	UOG COURSE

PPROVED/DISAPPROVED: _____ _____
Registrar, Admissions & Records **Date**

Appendix 7: Grants Awarded in the Last Five Years to Selected Faculty

Grants awarded in the last five years to some of the faculty of the Proposed Master Program in Sustainable Agriculture, Food and Natural Resources

Beneficiary	$ Amount	Source	Year
Dr. Hui Gong Jiang	293,216	CTSA, TSTAR, USDA	2009-2013
Dr. Mari Marutani*	897,104	USDA-NIFA, US Dept. Int. US Dept. Transp., US Forestry And Wildlife	2009-2018
Dr. Jim McConnell	1,603,750	Dept. Insul. Aff., CESU,	2013-2017
Dr. Mohammed Golabi*	797,491	Dept. Insul. Aff., T-STAR, USDA-NIFA, Okayama Univ. Multi-State	2009-2015
Dr. Hauhouot Diambra Odi*	397,956	Dept. Insul. Aff., Multi-State	2014-2016

* Co-beneficiary of Dept. Insul. Aff. Grant of $377,956

Attachments

		Page
Attachment A-1	Stakeholder Survey Result for SAFNR Graduate program (2016)	1
Attachment A-2	Alumini Survey Result for SAFNR Graduate program (2016)	3
Attachment A-3	Student Survey Result for SAFNR Graduate program (2016)	6
Attachment B	Suppot Letters from: (a) Northern and Southern Guam Soil Water Conservation Districts (Aug 30, 2016); (b) Guam Department of Agriculture (2012); (c) Guam Department of Public Health and Social Services (2012); (d) College of Micronesia (2013)	10
Attachment C	Department of Labor: Job outlook for Agricutural and Food Scientists (2016)	16
Attachment D	Student Survey Result (2013)	18
Attachment E	Student Signatures on a Petition to Support SAFNR Graduate program (2016)	25
Attachment F	Support Letters from Students and Alumni (Summer 2016)	28

Attachement A

Survey Results (Summer 2016)

Attachment A-1: Stakeholder Survey

Attachment A-2: Alumni Survey

Attachment A-3: Current UOG Student Survey

STAKEHOLDER SURVEY RESULT
for MS degree program in Sustainable Agriculture, Food and Natural Resources

Dates of Survey conducted: July 1, 2016 – August 26, 2016

Survey Method:

1. SurveyMonkey: Questionnaires were emailed and their referrals through SurveyMonkey online.

A. Background of Stakeholder respondents

a. Type of stakeholders, agency or organization participated in the survey

Type of agency or organization	Name of agency or organization
Local Government	Department of Agriculture
Federal Government	Guam State Agency for Child Nutrition Program
Private company	Pay-less Super Markets, Inc.; Donable Little
Non-profit organization/academic institution	College of Micronesia-FSM; UOG; Guam Plant Extinction Prevention Program
Total no. of respondents = 9	

b. If your agency/organization has positions that require post-graduate degrees or certifications, which field(s) do you seek?

Plant Pathology; Veterinary; Entomology; Nutrition; Health; Agriculture; Biology; Trade skills; Arborist certification; Botany; Agriculture and Natural Resources; Natural Sciences; Environmental Sciences

B. Responses:

Q1. Would a Sustainable Agriculture, Food, and Natural Resources graduate degree from the University of Guam be **a resource** in the following areas?

	Strongly agree (=4)	Agree (=3)	Disagree (=2)	Strongly disagree (=1)	No opinion	Total	Average Scale*
To your **employees**?	6	3	0	0	0	9	3.7
To your **career goals**?	8	0	0	0	1	9	4.0
To your **agency**?	8	1	0	0	0	9	3.9
To the **Guam**?	9	0	0	0	0	9	4.0
To the **Pacific region**?	8	1	0	0	0	9	3.9

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q2. If you agree to support a graduate degree in Sustainable Agriculture, Food, and Natural Resources at the University of Guam, **which graduate degree track** would fit best? (more than one selections)

Track	No. of respondents
Agriculture and Natural Resources (horticulture, soil sciences, plant protection)	8
Food and Nutrition (health, food safety, dietitian)	4
Do not agree	0
Please list any other related research topics (write in):	-

Q3. Would your employees benefit from a graduate certificate the University of Guam in any of followings?

Graduate Certificate	No. of respondents
a. Food and Nutrition	6
b. Island Sustainability	7
c. International Agriculture	4
d. Agriculture and Natural Resources	8
e. Tropical Horticulture	5
Not beneficial	0

Q4. Would your agency/organization be interested in **hosting graduate student interns from this degree program**?

Answer	No. of respondents
Yes	7
No	1

Q5. In your agency/organization, **how many employees would benefit** a graduate degree program in Sustainable Agriculture, Food, and Natural Resources at the University of Guam?

Stakeholder	No. of Employees will benefit
Guam Plant Extinction Prevention Program	5
Guam Department of Agriculture	8
College of Micronesia	5
Other Respondents: 10, 3(not sure); 3; 20; 3; 10	49
Total	67

ALUMNI SURVEY RESULT
for MS degree program in Sustainable Agriculture, Food and Natural Resources

Dates of Survey conducted: July 1, 2016 – August 26, 2016

Survey Method:

1. SurveyMonkey: Questionnaires were emailed and their referrals through SurveyMonkey online.
2. Paper Surveys: Questionnaires were distributed.

A. Background of alumni respondents

a. What is your current occupation?

Research Associate	3
Extension Associate	2
Rare Plant Nursery Manager	1
Teacher (Full time – limited term)	1
Supervisor	2
Secondary Science Teacher	1
Landscape Manager	1
Retired	1
Total number of respondents =	12

B. Responses:

Q1. Would a Sustainable Agriculture, Food, and Natural Resources Graduate degree program from the University of Guam be **a resource** in the following areas?

	Strongly agree (=4)	Agree (=3)	Disagree (=2)	Strongly disagree (=1)	No opinion	Total	Average Scale*
To your **current job**?	9	3	0	0	0	12	**3.8**
To your **career goals**?	8	2	1	0	0	12	**3.3**
To the **Guam**?	11	1	0	0	0	12	**3.9**
To the **Pacific region**?	11	1	0	0	0	12	**3.9**

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q2. If you are interested in pursuing a Graduate degree in Sustainable Agriculture, Food, and Natural Resources at the University of Guam, **which graduate degree track** would you be interested in? (more than one selection)

Track	No. of respondents
Agriculture and Natural Resources (horticulture, soil sciences, plant protection)	9
Food and Nutrition (health, food safety, dietitian)	4
Please list any other research topics (write in): **Agricultural Education**	1

Q3. If you are interested in pursuing a graduate degree at the University of Guam in Sustainable Agriculture, Food and Natural Resource, **what semester and year can you start?**

Academic Year	Fall semester	Spring semester
2016 – 2017	-	3
2017 – 2018	4	2
2018 – 2019	1	
2019 – 2020	1	
2020 – 2021	1	

Not interested = 1

Part-time = 5
Full-time=2

Q4. With regard to **course delivery**, please **rank** delivery option in order of preference.
(Scale: Rank 1 = most preferred; Rank 4 = least preferred)

Course Delivery	No. of Respondents				
	Rank 1 (Scale =4)	Rank 2 (Scale=3)	Rank 3 (Scale =2)	Rank 4 (Scale=1)	Average Ranking Scale *
a. Face-to-face/in-person daytime (i.e. Monday-Friday, 8am-5pm)	7	0	0	2	**3.3**
b. Face-to-face/in-person evening (i.e. night and weekend classes)	1	4	2	1	**2.6**
c. Online, distance education	1	1	2	4	**1.9**
d. Hybrid (i.e. combination of online and face-to-face)	1	4	4	1	**2.5**

*Average ranking scale: 4 is the highest and 1 is the lowest point.

Q5. Identify **the most limiting factor(s) in pursuing a graduate degree** at the University of Guam.

	Strongly agree (=4)	Agree (=3)	Disagree (=2)	Strongly disagree (=1)	No opinion	Total	Average Scale*
Financial support:							
Personal	7	2	2	0	0	11	**3.5**
Tuition	7	2	1	0	1	11	**3.6**
Research funding	5	3	1	0	2	11	**3.4**
Time:							
Personal	3	1	5	1	1	11	**2.6**
Course offering times	7	2	2	0	0	11	**3.5**
Job Outlook:							
Future career goals	4	3	3	1	0	11	**2.9**
Career promotion	4	3	3	0	1	11	**3.1**

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q6. From your experience as an undergraduate at University of Guam, identify **the factors that would influence your decision to pursue graduate studies** in Sustainable Agriculture, Food and Natural Resources at the University of Guam.

	Strongly agree (=4)	Agree (=3)	Disagree (=2)	Strongly disagree (=1)	No opinion	Total	Average Scale*
Quality of program facilities:							
Classroom	6	5	0	0	0	11	**3.5**
Laboratory	5	5	1	0	0	11	**3.4**
Experiment Station	7	4	0	0	0	11	**3.6**
Computer Lab	4	5	1	0	1	11	**3.3**
Library	3	6	1	1	0	11	**3.0**
Personal work space	4	6	1	0	0	11	**2.9**
Study space	3	4	4	0	0	11	**3.7**
Quality of program faculty	8	3	0	0	0	11	**3.7**
Courses:							
Track-specific	9	1	1	0	0	11	**3.7**
Field enrichment	10	1	0	0	0	11	**3.9**

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q7. At your current place of employment and/or among your fellow graduates, how many peers would be interested in a graduate degree in Sustainable Agriculture, Food and Natural Resources at the University of Guam?

Number of peers interested: 6, 10, 0, ?, 5, 4, 3, 6, 1, 6, and 3

Q8. Would you be interested in pursuing a **graduate certificate** at the University of Guam in the following areas? (more than one selection)

Graduate Certificate	No. of Respondents who have interests in graduate certificate program
a. Food and Nutrition	**3**
b. Island Sustainability	**5**
c. International Agriculture	**4**
d. Agriculture and Natural Resources	**10**
e. Tropical Horticulture	**8**
Not interested	0
Other (please specify): **Agricultural Education; Organic Agriculture; Agroecology; Conservation**	

CURRENT STUDENT SURVEY RESULT
for MS degree program in Sustainable Agriculture, Food and Natural Resources

Dates of Survey conducted: July 1, 2016 – August 26, 2016

Survey Method:

1. SurveyMonkey: Questionnaires were delivered to student emails and their referrals through SurveyMonkey online.
2. Paper Surveys: Questionnaires distributed to students on campus.

A. Background of student respondents

a. Major Program of respondents

Major	No of students
Accounting	2
Anthropology	1
Biology	2
Business Administration	4
Chemistry	1
Consumer and Family Science	3
Education	1
Health Science	3
Political Science	1
Pre-Pharmacy	1
Psychology	9
Secondary Education	1
Social work	1
Sociology	3
Tropical Agriculture Science	8
Total	41

b. Six students are also in Minor program

Minor	No. of students
Biology	1
Hotel Management	1
Mathematics	1
Psychology & Communications	1
Sociology	1
Women & Gender	1

c. Credit hours completed by respondents

Majority of respondents were Junior or Senior.

	Credit hours					
	0 <30	30-59	60-89	>90	Unknown	Total
No. of students	0	7	8	20	6	
% of students	0					

B. RESPONSES:

Q1. Would a Sustainable Agriculture, Food and Natural Resources graduate degree from the University of Guam be **an asset or be important** in the following areas?

	Strongly agree (=4)	Agree (=3)	Disagree (=2)	Strongly disagree (=1)	No opinion	Total	Average Scale*
To your **career goals**?	17	16	2	1	3	39	**3.4**
To **Guam**?	30	8	0	0	1	39	**3.8**
To the **Pacific region**?	30	8	0	0	1	39	**3.8**

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q2. If you are interested in pursuing a graduate degree in Sustainable Agriculture, Food and Natural Resources, **which graduate degree track** would you be interested in? (n=39 with multiple answer possible)

Track	No. of Students
Agriculture and Natural Resources (horticulture, soil sciences, plant protection)	16
Food and Nutrition (health, food safety, dietitian)	17
Not interested	7
Other areas (write in): Bioengineering/biometrics/biotechnology; Biosystem engineering	2

Q3. If you are interested in pursuing MS degree in Sustainable Agriculture, Food and Natural Resources, **what semester and year would you begin the program**?

Academic Year	Fall semester	Spring semester
2016 – 2017	-	3
2017 – 2018	12	2
2018 – 2019	2	1
2019 – 2020	5	2
2020 – 2021	4	

Not interested = 9

Semester	No. of students with the course load	
	Full time (>9 credits per semester)	Part time (<9 credits per semester)
Spring 2017		1
Fall 2017	3	7
Spring 2018		1
Fall 2018	1	
Spring 2019		1
Fall 2019	2	2
Spring 2020	1	
Fall 2020	2	1
Total	**9**	**13**

Q4. With regard to **course delivery**, please **rank** delivery option in order of preference.
(scale: Rank 1 = most preferred; Rank 4 = least preferred)

Course Delivery	No. of students				
	Rank 1 (Scale =4)	Rank 2 (Scale=3)	Rank 3 (Scale =2)	Rank 4 (Scale=1)	Average Ranking Scale *
a. Face-to-face/in-person daytime (i.e. Monday-Friday, 8am-5pm)	18	6	2	5	**3.2**
b. Face-to-face/in-person evening (i.e. night and weekend classes)	4	14	9	5	**2.5**
c. Online, distance education	4	5	8	15	**1.9**
d. Hybrid (i.e. combination of online and face-to-face)	5	8	13	6	**2.4**

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q5. Identify **the most limiting factor(s) in pursuing a graduate degree** at the University of Guam.

	Strongly agree (=4)	Agree (=3)	Disagree (=2)	Strongly disagree (=1)	No opinion	Total	Average Scale*
Financial support:							
Personal	21	13	1	1	3	39	**3.5**
Tuition	24	9	3	1	2	39	**3.5**
Research funding	16	11	2	0	10	39	**3.5**
Time:							
Personal	11	15	8	3	2	39	**2.9**
Course offering times	16	10	5	1	6	38	**3.3**
Job Outlook:							
Future career goals	15	15	5	2	2	39	**3.2**
Career promotion	6	19	7	2	5	39	**2.9**

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q6. From your experience as an undergraduate at University of Guam, identify **the factors that would influence your decision to pursue graduate studies** in Sustainable Agriculture, Food and Natural Resources at UOG.

	Strongly agree (=4)	Agree (=3)	Disagree (=2)	Strongly disagree (=1)	No opinion	Total	Average Scale*
Quality of program facilities:							
Classroom	14	18	3	0	3	38	**3.3**
Laboratory	23	13	1	0	2	39	**3.6**
Experiment Station	21	14	2	0	2	39	**3.5**
Computer Lab	11	18	6	1	3	39	**3.1**
Library	10	17	9	1	2	39	**3.0**
Personal work space	12	21	4	0	2	39	**3.2**
Study space	15	15	6	1	2	39	**3.2**
Quality of program faculty	27	7	1	0	4	39	**3.7**
Courses:							
Track-specific	18	17	1	1	2	39	**3.4**
Field enrichment	25	13	0	0	1	39	**3.7**

*Average scale: 4 is the highest and 1 is the lowest. The number of Respondents with "No opinion" was not included in calculation.

Q7. At your current place of employment and/or among your fellow graduates, **how many peers** would be interested in a graduate degree in Sustainable Agriculture, Food, and Natural Resources at the University of Guam?

Total Number of peers interested:	101

Q8. Would you be interested in pursuing a **graduate certificate** at the University of Guam in the following areas?

Graduate Certificate	No. of Students have interests in graduate certificate program
a. Food and Nutrition	**15**
b. Island Sustainability	**13**
c. International Agriculture	**7**
d. Agriculture and Natural Resources	**13**
e. Tropical Horticulture	**9**
Not interested	14
Other (please specify): Public Accounting; **Biotechnology**	2

Attachement B

Stakeholder Support Letters:

(a) Northern and Southern Guam Soil Water Conservation Districts (Aug 30, 2016);

(b) Guam Department of Agriculture (2012);

(c) Guam Department of Public Health and Social Services (2012);

(d) College of Micronesia (2013)

NORTHERN and SOUTHERN GUAM
SOIL & WATER CONSERVATION DISTRICTS
COLLEGE OF NATURAL & APPLIED SCIENCES, UOG STATION, MANGILAO GUAM 96923
t 671.735.2014 northernguamswcd@gmail.com/southernguamswcd@gmail.com

August 30, 2016

Mari Marutani, Ph.D.
Agriculture and Life Sciences Division
College of Natural and Applied Sciences
University of Guam, College Station
Mangilao, Guam

Hafa adai!

This letter is submitted in full support of the proposed Master of Science in Sustainable Agriculture, Food and Natural Resources degree program at UOG, College of Natural and Applied Sciences.

Established under 5GCA Ch71, the Northern and Southern Guam Soil and Water Conservation Districts (SWCD's) work in partnership with the University of Guam and other government of Guam entities overseeing local and federal programs established to promote the conservation, responsible use and development of Guam's soil and water resources to prevent and manage soil erosion and flooding, and to improve agriculture water management. As stewards of Guam's soil and water resources, the Guam SWCD's, are front and center for the care of our natural resources. Being elected district directors, we rely on and seek expert advice and technical knowledge from professionals, our partner agencies and institutions to accomplish many of our goals. Guam and the region stands to benefit from such a proposed masters program that will provide our community with professionals, that can help solve our growing agriculture and natural resource challenges. The Guam SWCD's is actively engaged with stakeholders in crafting local and national conservation policy and can afirm the need to train young professionals to continue this multi-disciplinary work.

NORTHERN and SOUTHERN GUAM
SOIL & WATER CONSERVATION DISTRICTS
COLLEGE OF NATURAL & APPLIED SCIENCES, UOG STATION, MANGILAO GUAM 96923
t 671.735.2014 northernguamswcd@gmail.com/southernguamswcd@gmail.com

Today we can see a growing segment of our population not only wanting to engage in sustainable agriculture and conservation, but people are demanding responsible development and use of our limited natural resources. Currently there is a trend of small-scale sustainable agriculture across the nation and within the region. Having a relevant local graduate program encourages local students to advance their professional training while helping to build up capacity and provide needed resource base of professionals that can make substantive quality contribution in the areas of sustainable agricultural production, healthy living and natural resource management.

The Guam SWCD's expect that our collaborative work with the University of Guam and with Guam's farm community in soil and water conservation will grow and qualitatively improve with the infusion of science-based information and decision making, e.g. in best practices, related research, soil health and productive farming. It is this type of substantive emphasis and support through this new program that will increase our success in soil and water conservation, a necessary link to a healthy community.

We stand and support the College of Natural and Applied Sciences in their endeavor to create a Master of Science in Sustainable Agriculture, Food and Natural Resources at the University of Guam.

Sincerely yours,

8/30/2016

Roland J. Quitugua, Chairperson — Date
Northern Guam Soil and Water Conservation District

8/30/2016

Angelita P. Mendiola, Chairperson — Date
Southern Guam Soil and Water Conservation District

Department of Agriculture
Dipåttamenton Agrikottura
163 Dairy Road, Mangilao, Guam 96913

Director's Office	734-3942/43; Fax 734 6569
Agricultural Dev. Services	734-3946/47; Fax 734 8096
Animal Health	734-3943
Aquatic & Wildlife Resources	735-3955/56; Fax 734-6570
Forestry & Soil Resources	735-3949/50; Fax 734-0111
Plant Nursery	734-3949
Plant Protection & Quarantine	472-1651; 475-1426 Fax 477-9487

Edward B. Calvo
Governor

Ray S. Tenorio
Lt Governor

Mariquita F. Taitague
Director

Manuel Q. Cruz
Deputy Director

December 26, 2012

Memorandum

To: Mrs. Helen Whippy, Ph D
Senior Vice President for Academic Affairs

From: Director of Agriculture

Subject: **Masters of Science in Sustainable Agriculture**
Re: Letter of Support

Buenas yan Hafa Adai!

I am writing in support of the application of the Agriculture and Life Sciences Division, College of Natural and Applied Sciences of the University of Guam for the Master of Science in Sustainable Agriculture, Food and Natural Resources Program.

This graduate program would be extremely beneficial for agriculture activities and increase productivity on Guam and Micronesia, and most of all, provide human resources badly needed for island agricultural sustainability. The program will also provide for further educational and career development of existing Bachelor of Science Agricultural Majors currently employed by Agriculture as well as an opportunity for others in related science field to expand their potential.

Our department relies on well-trained individuals who understand the need and aspiration of people from Guam and Micronesia, to lead our communities to fulfill a basic need: food self-sufficiency for better health. We believe that the University of Guam has an obligation to be proactive and to be the institution that shows the way in this region, for a more sustainable lifestyle.

I fully support the application of this vital program to provide continued education to our staff and train new leaders for agriculture of the twenty first century.

Sincerely,

MARIQUITA F. TAITAGUE

GOVERNMENT OF GUAM
DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES
DIPATTAMENTON SALUT PUPBLEKO YAN SETBISION SUSIAT

EDDIE BAZA CALVO
GOVERNOR

RAY TENORIO
LIEUTENANT GOVERNOR

JAMES W. GILLAN
DIRECTOR

LEO G. CASIL
DEPUTY DIRECTOR

NOV 07 2012

Helen Whippy, PH.D.
Senior Vice President for Academic Affairs
University of Guam, UOD Station
Mangilao, GU 96923

Dear Dr. Whippy

I am writing in support of the application of the Agriculture and Life Sciences Division, College of Natural and Applied Sciences of the University of Guam for the Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management Program.

This graduate program would fill a need for improved nutrition and health of our island communities, and also add new graduate courses to enlighten our staff in search for continuing education in public health.

In my opinion, a Master of Science in Sustainable Agriculture, Nutrition and Integrated Resource Management is long overdue. Sustainability involves a dynamic interaction of the social, economical and environmental challenges of the twenty first century and it is a great satisfaction to learn that the University community is engaging its resources to address critical issues of food biosecurity.

I fully support the application of this prestigious program to enhance the quality of life of our communities.

Sincerely,

James W. Gillan

11.8.12

COLLEGE OF MICRONESIA – FSM
P.O. Box 159, Kolonia, Pohnpei
Federated States of Micronesia 96941

Tel (691)320-2480/2481/2482 (Ext 138)
320-8181 (Direct Line)
Fax (691)320-2479
Direct Fax 320-2972

Office of Vice President for Cooperative Research and Extension

Date: 03.18.2013

Dr. Helen Wippy, Ph.D.
Senior Vice President for Academic Affairs

From: W. James Currie
Vice President for Cooperative Research and Extension
College of Micronesia-FSM

SUBJECT: **Masters of Science in Sustainable Agriculture: letter of support**

Greetings Dr. Wippy,

I am writing to you in support of the application of the Agriculture and Life Sciences Division, College of Natural and Applied Sciences of the University of Guam for the Master of Science in Sustainable Agriculture, Food and Natural Resources Program.

Such a Masters level program will be very useful to our Micronesian students. Due to the special USDA funding for Insular Areas, we have increased our enrollment in agriculture programs here at COM-FSM many fold over the past 7 years. The number of graduates planning to advance to university level is similarly increasing and two are presently at UoG in agriculture studies. Each year we send students on experiential learning visits to University of Guam to improve this link. A Master's program can only increase this interest since the University of Guam is their natural choice for higher education.

At this time, we are also facing a severe shortage of personnel throughout many of our departments due to the imminent retirement of a high percentage of qualified and experienced staff. Many of those positions require a BSc. Level degree or in many cases, a Masters is preferred. To have the opportunity to complete both of these degrees at our local university would certainly encourage our students.

I fully support the application for this program and if I might make two suggestions to potentially improve this offering they would be:

- I would actually change the name to **Master of Science in Island Sustainability, Agriculture and Food**
- Provide as much of the program as possible on-line through some form of Distance Education.

Sincerely,

W. James Currie

Attachement C

Job Ourlook for Agricultural and Food Scientists

Document from **Department of Labor**: (2016)

Agricultural and Food Scientists

Job Outlook

About this section

Employment of agricultural and food scientists is projected to grow 5 percent from 2014 to 2024, about as fast as the average for all occupations.

Employment of agricultural and food scientists is projected to grow as research into agricultural production methods and techniques continues. Pressures such as population growth, increased demand for water resources, combating pests and pathogens, changes in climate and weather patterns, and additional demand for agriculture products, such as biofuels, will continue to spur improvements in agricultural efficiency and sustainability.

Animal scientists will be needed to investigate and improve the diets, living conditions, and even genetic makeup of livestock. Food scientists and technologists will work to improve food-processing techniques, ensuring that products are safe, waste is limited, and food is shipped efficiently and safely. Soil and plant scientists will continue to try to understand and map soil composition. They will investigate ways to improve soils and will continue to selectively breed crops to resist pests and disease, improve taste, or to find uses for byproducts.



Note: All Occupations includes all occupations in the U.S. Economy
Source: U.S. Bureau of Labor Statistics, Employment Projections program

Job Prospects

A number of job vacancies will arise because many scientists are expected to retire within the next 10 years.

Employment projections data for agricultural and food scientists, 2014-24

Occupational Title	SOC Code	Employment, 2014	Projected Employment, 2024	Change, 2014-24 Percent	Change, 2014-24 Numeric	Employment by Industry
Agricultural and food scientists	19-1010	36,100	38,000	5	1,900	[XLSX]
Animal scientists	19-1011	2,900	3,200	7	200	[XLSX]
Food scientists and technologists	19-1012	15,400	16,000	3	500	[XLSX]
Soil and plant scientists	19-1013	17,700	18,900	7	1,200	[XLSX]

SOURCE: U.S. Bureau of Labor Statistics, Employment Projections program

< Pay
State & Area Data >

SUGGESTED CITATION
Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition*, Agricultural and Food Scientists, on the Internet at http://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm (visited *August 17, 2016*).

Publish Date: Thursday, December 17, 2015

Attachement D

Student Survey Result (2013)

For development of Graduate Program in Agriculture and Life Science Division

College of Natural and Applied Sciences

2012-2013 Agriculture and life Science Division

Development of Graduate Program Survey

Please answer the following questions with the best of your knowledge

(Please circle one answer only)

Q1: How do you describe yourself? (206 responses)

a. Full time student: 180 (87%) b. Part-time student 26 (13%)

Q2: Year in College (204 responses)

a Freshman 39 (19%) b. Sophomore 50 (24.5%) c. Junior 68 (34%)
d. Senior 45 (22%) e. Graduate Student 2 (0.5%)

Q3A: Major of study (163 responses)

a. Agriculture 13 (8%) b. Consumer & Family Sci. 16 (10%) c. Biology 17 (10%)
d. Education 29 (18%) e. Nursing/Health Sc. 29 (18%) f. Business/Accounting 10 (6%)
g. Other: (Undecided, Pre-Engineering, Pre-med, Psychology, Social Work, Political Sc., ..) 44 (27%)
h. English/Communication 5 (3%)

Q3B: Do you think that Guam should move toward self-sufficiency in food? (202 responses)

a. Yes 172 (85%) b. No 30 (15%)

Q4: Do think that the food we generally buy on Guam is fresh? (203 responses)

a. Yes 26 (13%) b. No 146 (72%) c. I do not know 31 (15%)

Q5: Have you lived on a farm before? (203 responses)

a. Yes 42 (21%) b. No 161 (79%)

Q6: Do (or did) you have a garden at home or a ranch? (204 responses)

a. Yes 117 (57%) b. No 87 (43%)

Q7: Have you ever raised farm animals before? (poultry, swine, goats, etc...) (202 responses)

a. Yes 78 (39%) b. No 124 (61%)

Q8: Rate your learning experience at UOG: (204 responses)

a. Excellent 34 (17%) b. Good 109 (53%) c. Average 56 (27.5%)

d. Below average 4 (2%) e. Not satisfactory 1 (0.5%)

Q9: What could make your learning experience better at UOG?

.....

.....

.....

Q10: Do you agree that UOG should offer a Master of Science Graduate program in Agriculture? (204 responses)

a. Strongly agree 79 (39%) b. Agree 93 (45.5%) c. Disagree 2 (1%)

d. Strongly disagree 1 (0.5%) e. I do not know 29 (14%)

Comments/Suggestions

Q11: If your answer to Q10 is either "Strongly agree" or "Agree", please circle the letter of the specialization that interests you. You may suggest other areas of specialization not included here. (165 responses)

Area 1: Agriculture and Natural Resources 66 (40%)

Area 2: Food and Nutrition 93 (56%)

Area 3: Adult Education and Extension 6 (4%)

Your suggested area of specialization: .....

Q12: Do you agree to have on-line courses in the Graduate Program of Agriculture and Life Sciences? (203 responses)

a. Strongly agree 28 (14%) b. Agree 54 (26.5%) c. Disagree 52 (26%)

d. Strongly disagree 13 (6%) e. I do not know 56 (27.5%)

Q13: If your answer to Q12 is either "Strongly agree" or "Agree", please suggest on-line course(s) you would like to take in the Agriculture Master Program: .....

Q14: I see myself working someday in a career that an agriculture degree would be useful. (202 responses)

a. Yes 40 (20%) b. No 74 (36.5%) c. I do not know 88 (43.5%)

Q15: I want a career that an agriculture degree would be useful. (202 responses)

a. Yes 44 (22%) b. No 44 (22%) c. May be 54 (26.5%)

d. I need more info 60 (29.5%)

Q16: I am interested in pursuing an advanced degree in Agriculture and Life Sciences. (202 responses)

a. Yes 24 (12%) b. No 81 (40%) c. May be 52 (26%)

d. I need more info 45 (22%)

Q17: If you had a choice on the name that best describes your aspirations, which one would you choose? (175 responses)

a. Master's in Sustainable Agricultural Sciences 17 (10%)
b. Master's in Sustainable Agriculture and Natural Sciences 66 (38%)
c. Master in Sustainable Agriculture and Life Sciences 67 (38%)
d. Other (please specify): (Nutrition, Agricultural Economics, other) 25 (14%)

Q18: What is the most limiting factor for you to consider in a graduate program in agriculture? (198 responses)

a. Tuition 55 (28%) b. Time 37 (19%) c. Job outlook 78 (39%)

d. Salary 18 (9%) e. Other. (interest, other) 10 (5%)

Q19: Would you like to see this Master's degree program in agriculture to include some student exchange program with other institutions of higher learning in Asia or elsewhere? (195 responses)

a. Yes 151 (77.5%) b. No 8 (4%) c. I do not know 36 (18.5%)

Q20: Would you be interested if you have the opportunity to obtain financial aid or assistantship? (Lab assistant, research assistant, teaching assistant) (195 responses)

a. Yes 124 (63%) b. No 15 (8%) c. May be 41 (21%)

d. I need more info 15 (8%)

Q21: Would you prefer this program entirely online? (188 responses)

a. Yes 11 (6%) b. No 88 (47%) c. May be 14 (7%)

d. Hybrid (a mixture of online and in classroom) 75 (40%)

Q22: Other comments:

Thank you for your time and participation

UOG Station, Mangilao, Guam 96923 Tel: 735-2100/01 Fax 734-4600

A Land Grant Institution Accredited by the Western Association of Schools and Colleges

Comments from student survey on Master's in Sustainable Agriculture

- Need more student activities
- Need more group projects
- Need better teaching methods
- Need more Master's options
- Need more major options
- Need more financial aid
- Administration has to show more effort to improve instruction
- Staff need to be friendlier
- Wish to have classes taught each semesters instead of every other year
- Abolish 50 minute classes
- Need more hands-on activities
- Students should have more opportunities for community service
- Need more opportunities for internship
- Wish to have lower tuition
- Need a stronger student career guidance program
- Need more evening courses
- Need to see more involvement of advisors in student life
- Social life at UOG can be a challenge
- Wish for more interactive learning
- Prefer less lectures and more activities
- Some teachers are constantly late in class
- Cafeteria needs to offer more variety of food
- UOG needs better facilities
- Need more passionate teachers
- Need better technology at UOG
- Desire more graduate programs
- Need more student services
- Tennis court needs to be rebuilt
- Teachers need to be more connected to students
- Student clubs need to advertise more on activities
- Teachers need to make lessons more interesting
- Need better parking
- Need more shade on campus
- Some classes are seriously boring
- Need a plant nursery on campus
- Have air conditioner in working conditions in all classrooms
- UOG needs to offer free tutoring
- Need more research opportunities for students
- Want more relevant assignment
- Desire more sustainable agriculture classes

- Desire more field trips to enhance learning
- Want the whole campus accessible on WIFI
- Would prefer homework submission online
- Want to see more green alternatives
- Need to improve communication between teachers and students
- Textbook are too expensive
- Want to see more vending machines on campus
- Want to see cheaper food at the cafeteria
- Want better professors in general
- Want to see more funding to labs
- Want more online classes
- Hope for more competent staff
- Wish to have designated smoking areas on campus
- Want better administrators
- Need more class discussions
- Want better customer services
- Need to improve gymnasium and sport fields
- Need computer lab in each of the colleges
- Want more agriculture classes
- Need guest speakers often
- UOG needs to develop stronger programs
- Some teachers are extroverted
- Have core programs that would benefit Guam and the people
- Need more accessible and available study facilities
- Less hazardous rooms and labs to work in
- Need to install safety equipment in labs
- Need 24 hr room for studying
- UOG needs more faculty
- Use other teaching methods in addition to typical power point lectures

Attachement E

Student Signatures

on a Petition to Support MS degree program in Sustainable Agriculrue, Food and Natural Resources (SAFNR)

College of Natural and Applied Sciences

Masters of Science in Sustainable Agriculture, Food and Natural Resources

Updated Signature Sheet (August 2016)

For students interested or in support of a Master of Science in "Sustainable Agriculture, Food and Natural Resources" among our current student body. If you are interested in this degree program becoming available in about one year, please sign your name below and provide the information requested.

Name	Signature	Year	Major
Mikayla Legaspi		Senior	Sec. Ed. Gen. Sci.
JOSEFA MUÑOZ		SENIOR	BIOLOGY
Eduardo Biala, Jr.		SENIOR	BIOLOGY
Elizabeth Valencia		SR.	Biology
Chelsea Von Guerrero		SENIOR	BIO/ Business Admin
JOSHUA SABLAN		Senior	Biology
Enrica Espiritu		SENIOR!	Biology
Tonirose Yanit		Senior	Biology
RIA CAMACHO		SENIOR	BIOLOGY
Aubriana Perez		senior	Biology
Catherine Capati		Sophomore	Pre-Engineering
Terrance Lopez		Sophomore	Engineering
Caitlin Barranco		Sophomore	Elem. Ed.
April Silvestre		Junior	~~Biology~~ Pre-Vet

College of Natural and Applied Sciences

Masters of Science in Sustainable Agriculture, Food and Natural Resources

Updated Signature Sheet (August 2016)

For students interested or in support of a Master of Science in "Sustainable Agriculture, Food and Natural Resources" among our current student body. If you are interested in this degree program becoming available in about one year, please sign your name below and provide the information requested.

Name	Signature	Year	Major
Edward Flores		Junior	Undeclared
JIANNA SORIANO		SOPHOMORE	AGRICULTURE
CHRISTIAN MILAN		SOPHOMORE	Education
Chieriel Desamito		Senior	Agriculture
Michael Fuzimi	M. Fuzimi	Junior	Agriculture
Jason I. Andrew		Associate	Agriculture
Daryll Keller		Junior	Agriculture
Beverlie Pretrick		Junior	Agriculture

Attachement F

Letters from Students and Alumni in Support of the MS degree program in Sustainable Agriculrue, Food and Natural Resources (SAFNR) (summer 2016)

September 9th 2016

My name is Chieriel Desamito and I am a senior and majoring in Tropical Agriculture at the University of Guam. I support the Agriculture,Consumer Family Sciences and Food Nutrition Master's Degree program here at the University of Guam. On Guam, the University should have a master program in Tropical Agriculture because we have many opportunities to study different fields of interest on Guam and help to expand more Agriculture related work and knowledge to future interested students. I believe if this Master's Program passes and is available, I would be excited to join the program and further my education more in agriculture. In addition, the program will help the future students (Agriculture major and others) at the University of Guam to have more choices to decide for master's program if this was implemented. For the Agriculture Majors (Research and Applied) will be relieved to know that the University of Guam has a master's degree program in Agriculture, Family Sciences and Nutrition to these future graduates. I strongly support this program to be implemented for the reasons of it being offered here on Guam where it is close to home and the feeling of relief of the struggles of working and paying ridiculous high tuition as a non-residential for master's degree somewhere off-island. In addition, I believe the professor's that are willing to teach the master's program here at University of Guam have researched and studied related agriculture work here Guam and these professors could share their new and present knowledge to future graduates. Thank you for your time.

Sincerely,

Chieriel Desamito

- Tropical Agriculture Major Senior at the University of Guam.

Dr. Marutani,

My name is Mario Martinez and I have a bachelor's degree in Tropical Agriculture from the University of Guam. I currently work for the Guam Plant Extinction Prevention Program as a Research Associate I.

I am writing to you in support of an Agriculture based Graduate program at the University of Guam. I have been thinking of going to graduate school for a few years and one of the factors has always been leaving island to pursue it. I believe I would be more likely to attend graduate school if I had a local option. I would also be able to do research on local topics. I am interested in conservation agriculture, indigenous agriculture, and native plant research. I could possibly stay at my current job with the Guam Plant Extinction Prevention Program if there was a graduate option here at UOG. Completion of a graduate degree program would allow me to move to a higher position in the program. It would also put me in a better position to start publishing some of the findings at GPEPP.

I think there are many other recent Agriculture graduates from UOG that would be interested in and benefit from an Agriculture based Graduate program. The other available options were made to fit other undergraduate degree programs and an Agriculture graduate often has to take prerequisite courses in order to enter the program. There are not many agriculture courses in the other programs. The other programs also have to be altered to make agriculture based research fit. If the program was already geared towards agriculture it would make more sense to do agriculture research in it.

Regards,

Mario Martinez

4/31/16

Hello Dr. Mari Marutani,

My name is Gregorio Borja III, a recent graduate of the Tropical Agriculture Program offered at the University of Guam. I currently work with the Guam Plant Extinction Prevention Program as a Research Associate I. I am exposed to native plant species and how they are of great importance to our island. In order for me to investigate in more detail our native species, I must further my education through a Masters program.

I have been out of school for about 2 years now and have thought about going to graduate school but have not for various of reasons. The main reason I have not applied to graduate school can be due to the mere fact that one in my field of study does not exist on the island. Also, the current masters program set up for me to go to graduate school does not focus on topics in my field of study. I am aware that a Masters program in Sustainable Agriculture, Food, and Natural Resources is currently in the works. I am in full support of this program and once erected I may be able to further my education. I believe that the program will help further my knowledge and the knowledge of my colleagues in preserving our resources here on island and those islands around us.



Regards,
Gregorio Borja III
8/31/16

TO WHOM IT MAY CONCERN:

Greetings,

My name is Jason Andrew. I am a UOG alumnus with a Bachelor degree in Tropical agriculture applied track. I am currently working at UOG CNAS under Dr. McConnell as a research Associate I. I am very interested in pursuing a Masters degree in Tropical agriculture. Unfortunately, there is no available program here at the University of Guam that will allow me to do so. Perhaps, I will have to continue to work until such time the graduate program is implemented, then I can take advantage of it. I understand that Sustainable Agriculture, Food and Natural Resources Program is under review by the Graduate Review Committee I believe that this program will benefit degree seeking and non degree seeking individuals. I strongly believe that this program will be very beneficial for me to look into, and I am very interested to enroll as a full-time student for the full degree. I feel that this program will help me expand my horizon in my field of study. As a Palauan native, I am planning to go back and apply sustainable practices in agriculture and food technologies to benefit my Island and its people. The similarities of climate, natural environment and culture will make this program well-suited for the region.

Sincerely:

05 Sept. 2016

Jason Andrew

August 29, 2016

Mari Marutani, PhD
University of Guam
Mangilao, Guam

Dear Dr. Mari,

I fully support the proposed Master of Science in Sustainable Agriculture, Food and Natural Resources Program for University of Guam. This program will provide additional opportunities for the advancement of students both on Guam and within the region. It will also provide a needed expansion to the University of Guam's MS program.

I am a graduate with a B.S. in Tropical Agriculture and a full-time Extension Associate for the University of Guam, College of Natural & Applied Science's Extension and Outreach program. In order for me to advance both my education and career, I have been searching for MS programs specializing in Sustainable Agriculture. On a recent Sustainable Agriculture Research and Education (SARE) conference I attended, I was able to meet with agricultural professionals from many mainland colleges to discuss their programs. Many of their programs offer specializations in Sustainable Agriculture, however it would require me to move and leave my job. If the proposed MS program goes through, I would be able to continue my studies here at the University of Guam and continue my career.

I support the proposed program and feel that this will be a great opportunity for students that which will eventually lead to a better served and educated island community.

Sincerely,

Mark Acosta

August 31, 2016

Dr. Mari Marutani,

I, Joseph 'Joe' Tuquero, am a former student of the University of Guam (UOG). I received a bachelor's degree in Agriculture and a master's degree in Environmental Science from the university. I am currently an Extension Agent II of the Extension & Outreach Division, College of Natural and Applied Sciences, UOG.

From my graduate scholastic experience, I found that courses specifying in advanced agriculture were minimal within the Environmental Science Master's Program. The program was fulfilling as it was the closest graduate program in the university that could broaden my agricultural knowledge and experience.

I support the proposed Sustainable Agriculture, Food and Natural Resources MS Program for UOG. The existence of this program will increase options for graduates from undergraduate science programs who are interested in obtaining advanced degrees within the university. Such an advanced program is needed to improve expertise, technical knowledge and experience in highly important regional issues concerning the overall quality of life for citizens of this region. Agriculture is an integral part of everyday life as it is a science that engages in the basic, most important necessities of life (food, clothing, shelter). Advanced education in agriculture will enhance the sustainability of both commercial and subsistence agriculture in the region. Advanced expertise in sustainable agriculture will strengthen the foundation of technologies that will lead to less dependence on imported food products, and will improve food security. Advanced expertise in Natural Resources is definitely needed in the region to continue to improve the sustainability of the fragile natural resources of the region. Fragile natural resources such as drinking and recreational water, native forests and ecosystems, coral reefs and fisheries, and soil quality need to be sustained and improved for today and tomorrow's generations. Advanced education in Natural Resources will improve knowledge and strategies aimed to balance the sustainability of natural resources with population fluctuations, natural disasters, and industrial development. Advanced expertise in Food and Nutrition will lead to improved knowledge and promotion of healthier lifestyles in the region. Obesity, diabetes, cancer, and many other diseases are prominent in the region. Much of these illnesses are derived from unhealthy choices of food and nutrition. Increased knowledge of Food and Nutrition will lead to overall quality of life for all and future generations.

This proposed program will be a great addition to the university and communities of the region.

Sincerely,

Joe Tuquero