

**FAIK, JCSU
DHS COASTAL RESILIENCE CENTER
EDUCATION PROJECT
FINAL/YEAR 3 REPORT TEMPLATE**

Project Title:

Preparing Tomorrow's Minority Task Force in Coastal Resilience through Interdisciplinary Education, Research, and Curriculum Development.

Principal Investigator Name/Institution:

PI, Dr. Ahmed Faik, Johnson C. Smith University

Other Partners/Institutions:

UNC-Chapel Hill, UNC-Charlotte, and Jackson State University (major partners)

Project Start and End Dates:

July 1, 2017 – June 30, 2018

Short Project Description:

We focus on the integrative, interdisciplinary nature of real-world problems and strive to bridge traditional academic programs to develop solutions to coastal resilience and its related problems facing our nation. The proposed program will build an undergraduate education framework to prepare tomorrow's minority task force in coastal resilience (approximately 80% of students are minorities), which presents tailored courses in coastal resilience, applied research experience, knowledge transfer activities, scientific seminars, and summer camps.

PROJECT NARRATIVE:

1. Introduction and project overview:

Given the national need to prepare future coastal resilience professionals with educational and research experience, this proposed program supports a critical mission. Most existing coastal resilience related curriculum currently either target graduate programs or vocational education. We developed an undergraduate education framework that meets the needs and standards for excellence in undergraduate education.

The project was designed around the following aims:

- 1) **Goal 1:** Develop a curriculum to prepare undergraduate students for careers in coastal resilience;
- 2) **Goal 2:** Create partnerships to conduct applied research in the area of coastal resilience;
- 3) **Goal 3:** Create ongoing opportunities for the transfer of skills, knowledge, people and ideas between JCSU and the community at large.

To help reach the above-mentioned goals, we defined the following processes:

- 1) **Process 1:** Develop four new courses to educate students with demonstrated interests and aptitudes in coastal resilience study;
- 2) **Process 2:** Design and deploy interdisciplinary coastal resilience seminar series;
- 3) **Process 3:** Establish and develop Faculty/Student research collaborations in coastal resilience;
- 4) **Process 4:** Design and offer a 1-week summer research camp to expose and increase the awareness of undergraduate students in coastal resilience study.
- 5) **Process 5:** Design and offer a 4-week summer research project to expose and increase the awareness of undergraduate students in coastal resilience study.

2. Project History:

- 1) **Process 1:** Three courses related to the DHS CRC program (Data Mining, Introduction to Geographic Information System (GIS), Risk Analysis and Management) were developed. Two of these three courses (Introduction to Geographic Information System (GIS), Risk Analysis and Management) were also taught. The third course (Data Mining) was given a code and added to the catalog. We are planning on having the two above-mentioned courses (Introduction to Geographic Information System (GIS), Risk Analysis and Management) added to the catalog as well. We are also planning on developing, teaching and adding to the catalog a fourth course (Technology in Emergency Management).
- 2) **Process 2:** We developed, added to the curriculum of the department major and presented 2 seminar series. In these seminar series we had five professors from different universities, who are involved in research related to the DHS CRC program, give presentations about their corresponding topics of research.
- 3) **Process 3:** two faculty members in our computer science department developed and conducted faculty/student CRC-related research during the Spring 2018 semester.
- 4) **Process 4:** One group of 20 students conducted a one-week summer research camp supervised by two faculty members from our Computer Science and Engineering department.
- 5) **Process 5:** Three groups of 4 students each conducted 4-weeks summer research project, each of which were supervised by one faculty member from our Computer Science and Engineering department.

3. Results.

- 1) Three courses were developed (Data Mining, Introduction to Geographic Information System (GIS) and Risk Analysis and Management), and taught during the regular academic semesters. The students who attended and passed the courses received credit as part of their required credit for their majors.
- 2) The students who attended and completed the requirements for the seminar series received credit as part of their required credit for their majors.
- 3) Students who participated in the research projects during the Spring 2018 semester gained valuable experience in topics related to the DHS mission. Additionally, those students, who conducted the research, will have the opportunity to present their findings in future conferences.
- 4) The students who attended both, the 1-week summer research camp as well as the 4-week summer research project, conducted intensive research related to the DHS CRC program. All the students presented their work at the end of their research period to several faculty

members from the STEM College. Additionally, those students, who conducted the research, will have the opportunity to present their findings in future conferences.

4. **Students:**

All the students in our Computer Science and Engineering department, and therefore all the students who attended the courses, the seminars and the research projects that were funded by the DHS grant were undergraduate students.

How many graduated during your project?

None.

Approximately how many are employed in the Homeland Security Enterprise?

We don't know yet if any of our graduates applied or is currently employed in the Homeland Security Enterprise.

5. **Institutionalization:** *Describe how your project will be institutionalized beyond CRC funding.*

a. *What will be the sources of ongoing support?*

Other grants available in the STEM college listed in table 2.

b. *Where in your institution will your project be maintained?*

The project will be maintained in our STEM College.

c. *Who will be involved in sustaining your project?*

Some of the faculty members of our Computer Science and Engineering department as well as one or two faculty members of the Natural Sciences and Mathematics (NSM) department will be involved in sustaining the project. Mostly the same faculty members who were involved in the project in the past year, plus one or two others.

6. **Interactions with research projects:**

Five professors from different universities, who are involved in research related to the DHS CRC program, gave presentations about their corresponding topics of research.

The summer research camp and projects that were conducted in the summer of 2018 were centered around Coastal Resilience subjects.

7. **Publications:**

Ying Bai & Hang Chen, "Build an Optimal Evacuation Contraflow Model for Natural Disasters by Using Fuzzy Inference System", to be appeared on Proceedings of the 2018 IEEE International Conference on Fuzzy System, July 8-13, Rio de Janeiro, Brazil, 2018.

8. **Lessons Learned:**

What would you do the same and why?

We would develop and implement the courses, seminars and research projects in very much the same way.

What changes would you make and why?

We would try to connect and collaborate more with end users, faculty members of outside education institutions who are conducting research related to the DHS CRC program as well as with other experts in research fields related to the DHS CRC program.

9. Tables:

Table 1: Documenting CRC Education Project Courses and Enrollments

Courses Developed and Taught by Johnson C Smith University under Project DHS CRC				
<u>Course</u>		<u>Developed (D), Revised (R), and/or Taught (T), by Project Year</u>		
<u>Number</u>	<u>Title</u>	<u>1</u>	<u>2</u>	<u>3</u>
CSC432	Data Mining	D, T	T	R, T
Offering: Elective (E), Concentration (C), Minor (M)		E	E	E
Enrollment		12	8	10
CSE439A	Introduction to Geographic Information System (GIS)			D, T
Offering: Elective (E), Concentration (C), Minor (M)		-	-	E
Enrollment		-	-	10
CSE439B	Risk Analysis and Management		D, T	
Offering: Elective (E), Concentration (C), Minor (M)		E	E	E
Enrollment			10	
CSC210	Career Prep I		D	T
Offering: Elective (E), Concentration (C), Minor (M)				C
Enrollment				16
CSC211	Career Prep II		D	T
Offering: Elective (E), Concentration (C), Minor (M)				C
Enrollment				19

Table 2: Documenting External Funding and Leveraged Support

2A: External Funding			
<u>Title</u>	<u>PI</u>	<u>Total Amount</u>	<u>Source</u>
Minority Science and Engineering Improvement Program (MSIEP): Embedding Active and Experiential Learning and Entrepreneurial Thinking into Computer Science and Engineering Education	Dr. Suryadip Chakraborty	\$736,286	Department of Education
ASPIRE: Ambassador Scholarship Program in Research and Education	Dr. Dawn McNair	\$598,500	National Science Foundation
The Virginia-North Carolina Louis Stokes Alliance for Minority Participation program (VA-NC Alliance)	Dr. Sunil Gupta	\$297,220	National Science Foundation
Innovating the Research Educational Experiences	Dr. Tracy Brown-Fox	\$399,911	National Science Foundation
2B: Leveraged Support			
<u>Description</u>			<u>Estimated Annual Value</u>

Table 3: Performance Metrics:**Hang Chen, JCSU**

<u>Metric</u>	<u>Year 1</u> (1/1/16 – 6/30/16)	<u>Year 2</u> (7/1/16 – 6/30/17)	<u>Year 3</u> (7/1/17 – 6/30/18)
HS-related internships (number)	1	1	0
Undergraduates provided tuition/fee support (number)	0	0	0
Undergraduate students provided stipends (number)	37	47	40
Graduate students provided tuition/fee support (number)	0	0	0
Graduate students provided stipends (number)	0	0	0
Undergraduates who received HS-related degrees (number)	9	20	7
Graduate students who received HS-related degrees (number)	0	0	0
Certificates awarded (number)	0	0	0
Graduates who obtained HS-related employment (number)	3	0	0
Lectures/presentations/seminars at Center partners (number)	0	0	0
DHS MSI Summer Research Teams hosted (number)	0	0	0
Journal articles submitted (number)	1	1	1
Journal articles published (number)	0	0	1
Conference presentations made (number)	0	2	0
Other presentations, interviews, etc. (number)	0	0	0
Trademarks/copyrights filed (number)	0	0	0
Requests for assistance/advice from DHS agencies (number)	0	0	0
Requests for assistance/advice from other agencies or governments	0	0	0
Total milestones for reporting period (number)	7	6	0
Accomplished fully (number)	4	6	0
Accomplished partially (number)	3	0	0
Not accomplished (number)	0	0	0

10. Year 3 Education Activity and Milestone Achievement:

Education Activities and Milestones: Final Status as of 2018

Reporting Period 7/1/17 – 6/30/18			
Education Activities	Proposed Completion Date	% Complete	Explanation of why activity/milestone was not reached
Taught 2 new 3-credit hour courses	5/30/2018	100%	
Taught 2 new 1-credit hour seminar series	5/30/2018	100%	
Conducted 2 spring semester research projects	5/30/2018	100%	
Conducted 4-week summer research camp	6/30/2018	100%	
Conducted 3 parallel 1-week summer research projects	6/30/2018	100%	
Education Milestones			
New course being developed and will be taught next academic year	5/30/2018	100%	
20 students completed the 2 new courses	5/30/2018	100%	
8 students completed the spring semester research project	5/30/2018	100%	
20 students completed the 1-week summer research camp	6/30/2018	100%	
12 students completed the 4-weeks summer research project	6/30/2018	100%	

11. Year 3 Transition Activity and Milestone Achievement:

Transition Activities and Milestones: Final Status as of 2018

Reporting Period 7/1/2017 – 6/30/2018			
Transition Activity	Proposed Completion Date	% Complete	Explanation of why activity/milestone was not reached
The students who participated in the research projects will be available for employment in the greater Homeland Security enterprise.	06/30/2018		
Dissemination of the undergraduate education and research education framework and results.	06/30/2018		
Develop the collaboration with research partners.	06/30/2018		
Transition Milestone			
Graduates are employed in greater HS enterprise or continued graduate school enrollment	06/30/2019	In progress	We will track our graduates to monitor their future applications and employments
Conference presentation and publications of the project results.	06/30/2019	In progress	We are planning on sending our students who attended our research projects to conferences to present their research findings