

**BOARD OF GOVERNORS  
STATE UNIVERSITY SYSTEM OF FLORIDA  
NEW DOCTORAL DEGREE PROPOSAL STAFF ANALYSIS**

**Program:** Master's of Data Science      **CIP Code:** 11.9999  
**Institution:** New College of Florida      **Proposed Implementation Date:** Fall 2015  
**Staffed By:** D. Barbu; R. Stevens      **Initial Review Date:** 9/10/14      **Last Update:** 10/13/14

**Projected program costs:**

|        | Total     | % & \$<br>Current<br>Reallocated | % & \$<br>New<br>Recurring | % & \$<br>New Non-<br>Recurring | % & \$<br>C&G     | Auxiliary<br>Funds | E&G<br>Cost per<br>FTE | SUS 12-13<br>Average<br>Cost per<br>FTE |
|--------|-----------|----------------------------------|----------------------------|---------------------------------|-------------------|--------------------|------------------------|---|
| Year 1 | \$267,206 | 0<br>\$0                         | 99.1%<br>\$264,806         | 0.8%<br>\$2,400                 | 0<br>\$0          | \$0                | \$44,534               | \$13,268.8<br>CIP 11                    |
| Year 5 | \$411,806 | 86.3%<br>\$355,431               | 0<br>\$0                   | 0<br>\$0                        | 13.7%<br>\$56,375 | \$0                | \$20,908               |   |

**Projected FTE and Headcount are:**

|                    | Student Headcount | Student FTE |
|--------------------|-------------------|-------------|
| <b>First Year</b>  | 8                 | 6           |
| <b>Second Year</b> | 23                | 14          |
| <b>Third Year</b>  | 30                | 17          |
| <b>Fourth Year</b> | 30                | 17          |
| <b>Fifth Year</b>  | 30                | 17          |

*On March 29, 2007, the Florida Board of Governors approved Board Regulation 8.011, which sets forth criteria for implementation and authorization of new doctorates by the Board of Governors, as well as criteria for implementation and authorization of Bachelor's, Master's and Specialist degrees by Boards of Trustees. The following staff analysis is an assessment of how well the university meets Board Accountability and Readiness criteria for implementation of this degree program.*

**Proposal Page Numbers:**

| INTRODUCTION        |           | ACCOUNTABILITY |        | READINESS            |                 |            |         |           |
|---------------------|-----------|----------------|--------|----------------------|-----------------|------------|---------|-----------|
| Program Description | SUS Goals | Overall        | Budget | Mission and Strength | Program Quality | Curriculum | Faculty | Resources |
| 2                   | 3         | 3              | 8      | 11                   | 14              | 17         | 20      | 21        |

**A. Program Description:**

The New College of Florida (NCF) is proposing to offer a Master's of Data Science at its main campus. The purpose of the proposed program is to provide individuals with post-baccalaureate training required to pursue a career in the rapidly evolving data science sector.

The proposed NCF program would be the first stand alone Master in Data Science program to be offered by a public university in the state of Florida. Other universities in the system offer similar programs as a major under the Master's in Statistics (Florida State University) or a certificate in data mining (University of Central Florida). The proposed master program will require the completion of 36 credit hours (9 required core courses, 2 restricted elective courses, and 1 practicum semester). The program will only accept students with a bachelor's degree which includes demonstrated proficiency in elementary probability, statistics, linear algebra, and programming.

**B. System-Level Analysis and Evaluation in accordance with BOG Regulation 8.011:**

The proposal references State University System (SUS) Strategic Planning Goals for 2012-2025. The proposal notes that the new program supports the following two goals:

- Increase the number of degrees awarded in STEM and other areas of strategic emphasis.
- Increase levels of community and community and business engagement

**Increase the number of degrees awarded in STEM and other areas of strategic emphasis.**

According to the proposal, the program will focus on increasing the number of degrees awarded in STEM areas. Programs in the 11 CIP code are universally considered to be STEM programs.

**Increase levels of community and community and business engagement**

The proposal notes in the program description section that corporate sponsors have been recruited to enhance the educational experience of the students enrolling in this program. However, no specific steps or plans are offered on how NCF will achieve this goal.

**Need Analysis**

The NCF proposal cites a McKinsey Global Institute study from 2011 which explained that the US faces “a shortage of 140,000 to 190,000 people with deep analytical skills as well as analysts to analyze big data and made decisions based on their findings” (p. 4). The proposal estimates that the Florida portion of shortage of employees with these skills could be at 1,400-1,900 positions and the proposed programs is intended to help fill this gap.

According to the proposal the Bureau of Labor Statistics (BLS) does not track a labor category for data science or data analytics, rather the proposal offers alternative employment categories: Computer and Information Research Scientists, Statisticians, and Mathematicians. The board of Governor’s staff research shows that for the occupations listed, such as Computer and Information Research Scientists the entry-level of education is typically a doctoral or professional degree, and for others the typical credential is a graduate level degree in the specific area mentioned. However, staff research shows that a Market Research Analyst may be a more appropriate BLS occupational title for graduates of the Master in Data Science program. Employment opportunities for Market Research Analysts are projected to grow by 32% (faster than the average) between 2012-2022, with a 2012 median salary of \$60,300. Although the entry-level educational requirement for this type of position is typically a baccalaureate degree, graduates of the proposed Master in Data Science can be expected to be very competitive for such occupations. It should also be noted that the BLS coding taxonomy does not include emerging occupations until after they have become well established, so there is currently no single occupational code that aligns with data analytics.

The proposal notes that a current search on [www.simplyhired.com](http://www.simplyhired.com) for job positions in data science showed 486 openings in Florida and 230 openings within 100 miles from Sarasota. Board staff searched for the same terms (data science) on the same website on September 10, 2014 and found a total of 23 openings requiring a master’s degree and 162 requiring a bachelor degree, within 100 miles from Sarasota. At the state level, the same search terms on the same website showed 34 openings which required a master’s degree and 367 openings requiring a bachelor degree. At the national level the website revealed a total of 1,650 openings requiring a master’s degree and 10,103 openings requiring a bachelor degree. Clearly there is workforce demand for this field, although that demand may be a little overstated in the proposal.

### **Demand Analysis**

With regard to student demand, the proposal mentions a survey of current students (number of respondents: 75), 45% of which indicated an interest in the program. A survey of recent NCF alumni is also mentioned in the proposal, 35% of them indicating an interest in the proposal. The proposal also explains that a similar program (Data Analytics) at North Carolina State University is in high demand and its

acceptance rate is 12.8% with graduates from this program earning a median base salary of \$96K.

In terms of enrollment projections, the proposal indicates that eight (8) students are expected to enroll in the proposed program in the first year, increasing to 30 students by the fourth year, and remaining stable at 30 after that. The university plans to recruit 75 percent of its Master in Data Science students from among NCF graduates and 25 percent from agencies or industries in the data science field.

New College of Florida offers only one baccalaureate program (Liberal Arts) which provides students with flexibility in choosing their major areas of emphasis. Table A shows enrollments and the number of degrees awarded in this program.

Table A: New College of Florida – Enrollments and Degrees Awarded

| Liberal Arts<br>(CIP 24.0199) | Enrollments |      | Degrees Awarded |           |
|-------------------------------|-------------|------|-----------------|-----------|
|                               | 2012        | 2013 | 2011-2012       | 2012-2013 |
| Bachelors level               | 833         | 794  | 179             | 198       |

*\*Source: Board of Governors interactive database*

### **Substantially Similar Programs**

Currently, no university in the State University System is offering a master’s program in CIP 11.9999 or a stand-alone master’s program in data science or data analytics. However, the proposal notes that Florida State University (FSU) is offering a major in data analytics under the masters in statistics and University of Central Florida (UCF) is offering a certificate in data mining. It is noted in the proposal that the program’s pre-proposal was discussed at the Council of Academic Vice-Presidents (CAVP) meeting on April 25, 2014 and no concerns were expressed in regards to the development of the full proposal for this program. Florida Polytechnic University, FSU, UCF, and University of South Florida also provided letters of support for the implementation of this program.

### **Summary**

The proposed Master in Data Science is NCF’s first graduate program and second stand alone program developed by the college in its history. Evidence exists that the demand for graduates from data science and related area programs is increasing at the local, state, and national level, therefore a program at NCF would help address that demand.

## **C. Assessment of the University Review Process in accordance with BOG**

**Regulation 8.011:**

*Due to the system of stair step accountability set in place by the Board of Governors in Regulation 8.011, it is now incumbent upon University Board of Trustees to verify that all doctoral programs coming before the Board of Governors have met the requirements of the regulation. The following is an assessment of the university review process to ensure that all criteria set forth have been considered by the university prior to submission to the Board of Governors office.*

**ACCOUNTABILITY**

*Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.*

**1. Overall** – *The proposal is in the correct format, includes all necessary signatures, and contains complete and accurate tables for enrollment projections, faculty effort, and the proposed budget.*

**YES NO**

**The proposal has been approved by the university board of trustees and includes all required signatures.**

New College of Florida’s Board of Trustees approved the program on August 28, 2014.

**The university has provided a proposal written in the standard SUS format which addresses new academic program approval criteria outlined in BOG Regulation 8.011.**

The Board of Governors new degree proposal format is used, as expressed in the Board’s Regulation 8.011.

**The university has provided data that supports the need for an additional program in the State University System as well as letters of support or concern from the provosts of other state universities with substantially similar programs.**

No similar stand-alone programs in data science are offered in the SUS. The university communicated with the other institutions offering majors or concentrations in this area and received support for the proposed program.

**The university has provided complete and accurate projected enrollment, faculty effort, and budget tables that are in alignment with each other.**

The university provides adequate information on enrollment (Table 1-B), budget (Table 2 & 3) and faculty effort (Table 4).

**The university has included a statement in the proposal signed by the equity officer as to how this proposal will meet the goals of the university's equity accountability plan.**

The program plan for achieving diversity has been reviewed and signed by the NCF's Equal Opportunity Officer on August 27, 2014.

**The program does not substantially duplicate programs at FAMU or FIU or, if it does, evidence was provided that consultations have occurred with the affected university on the impact of the new program on existing programs.**

The proposed program does not duplicate any program offered at FAMU or FIU.

*2. Budget - The proposal presents a complete and realistic budget for the program consistent with university and BOG policy, and shows that any redirection of funding will not have an unjustified negative impact on other needed programs.*

**YES NO**

**The University Board of Trustees has approved the most recent budget for this proposal.**

The current budget was approved by the NCF Board of Trustees on August 28, 2014.

**The university has reviewed the budget for the program to ensure that it is complete and reasonable, and the budget appears in alignment with expenditures by similar programs at other SUS institutions.**

The average SUS expenditure per student credit hour in 2012-2013 for master level CIP 11 was \$141.65 for a total of \$13,268.8 per student FTE. New College of Florida is proposing that in the first year of operation the cost per FTE will be \$44,431 and by the fifth year of operation the total cost per student FTE will be \$20,908. Hence the proposed program seems to be quite expensive.

According to Table 2, in the first year of operation, the majority of the projected cost of \$264,806 will be used for faculty salaries and benefits for the 5 existing faculty and 4 future hires. The program expenses are expected to increase from \$11,800 in year 1 (E&G funds) to \$60,000 in year 5 (combination of E&G and C&G funds).

**In the event that resources within the institution are redirected to support the new program, the university has identified this redirection and determined that it will not have a negative impact on undergraduate education, or the university has provided a reasonable explanation for any impact of this redirection.**

The university identified and addressed the impact of the implementation of the new program on the existing undergraduate graduate program. As the proposal notes, the undergraduate program will not be negatively impacted and once the new program is implemented each of the four faculty members to be hired for the master's program will also teach undergraduate classes.

### **READINESS**

*Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.*

*3. Program Quality – The proposal provides evidence that the university planning activities have been sufficient and responses to any recommendations to program reviews or accreditation activities in the discipline pertinent to the proposed program have been addressed.*

**YES NO**

**The university has followed a collaborative planning process for the proposed program in accordance with policies and procedures adopted by the University Board of Trustees.**

**An external consultant has reviewed the proposal and supports the department's capability of successfully implementing this new program.**

Typically an external consultant review is not required for programs at master's level. However, a consultant was used to help develop the curriculum for the program.

**The university has found the level of progress that the department has made in implementing the recommendations from program reviews or accreditation activities in the discipline pertinent to the proposed program to be satisfactory.**

According to the proposal, the Physical Sciences discipline was reviewed in 2012, and the Social Sciences discipline was reviewed in 2014. These are expected to be feeder undergraduate disciplines for the proposed master's degree. The proposal lists the reviews' recommendations as well as the progress that NCF made on each of these recommendations.

**The university has analyzed the feasibility of providing all or a portion of**

**the proposed program through distance learning.**

The proposal notes that the program will be delivered through face-to-face interactions at NCF's main campus.

*4. Curriculum - The proposal provides evidence that the university has evaluated the proposed curriculum and found that it describes an appropriate and sequenced course of study, and that the university has evaluated the appropriateness of specialized accreditation for the program.*

**YES NO**

**The university has reviewed the curriculum and found that the course of study presented is appropriate to meet specific learning outcomes and industry driven competencies discussed in the proposal.**

The curriculum includes 36 credit hours (9 required core courses, 2 restricted elective courses, and 1 practicum semester).

**The university anticipates seeking accreditation for the proposed doctoral program, or provides a reasonable explanation as to why accreditation is not being sought.**

The proposal states that there are no accrediting agencies for the proposed master program. Although the Accreditation Board for Engineering and Technology, Inc. (ABET) accredits computer some related programs offered under the 11 CIP code, it is only at the baccalaureate level.

*5. Faculty - The proposal provides evidence that the university is prepared to ensure a critical mass of faculty will be available to initiate the program based on estimated enrollments, and that faculty in the aggregate have the necessary experience and research activity to sustain a doctoral program.*

**YES NO**

**The university has reviewed the evidence provided and found that there is a critical mass of faculty available to initiate the program based on estimated enrollments.**

Table 4 in the proposal shows that five (5) faculty members are already available for the implementation of the program and four (4) additional ones will be hired prior to the program's implementation (Fall 2015).

**The university has reviewed the evidence provided and found that the faculty in aggregate has the necessary experience and research activity to sustain the program.**

According to table 4 the five current professors hold terminal degrees in their fields. Three faculty hold tenure-earning positions and two have earned tenure. Out of the four new faculty members that are expected to be hired before the implementation of the program, three will be on a tenure earning position, and one in a tenured position.

**The university has reviewed the evidence provided and found the academic unit(s) associated with this new degree to be productive in teaching, research, and service.**

According to the proposal over the past three years course enrollments in Mathematics increased by 22% and in Statistics increased by 40%. Graduates of NCF are reported to have pursued PhD degrees at MIT, Cal Tech, University of Chicago, and Carnegie Mellon University, pursue employment with Ancestry, Inc, or Ryken, or achieved success as entrepreneurs.

While NCF is a teaching-intensive institution the proposal notes that its faculty has secured grants from National Science Foundation and has been publishing in top-ranked peer-reviewed journals. However, no actual number in terms of amount of grants secured is offered. Finally, in terms of service, the proposal notes that faculty is very active in service both in the profession and in the local community. For example, one of the professors has been active in the NSF EDGE program which encourages women to complete graduate study in Mathematics.

**If appropriate, the university has committed to hiring additional faculty in later years, based on estimated enrollments.**

The proposal mentions the need for hiring four additional faculty members before the implementation of the program.

*6. Resources – The proposal provides evidence that the university has ensured the available library volumes and serials; classroom, teaching laboratory, research laboratory, office space, equipment, clinical and internship sites, fellowships, scholarships, and graduate assistantships will be sufficient to initiate the program, and that if applicable, funding has been secured to make more resources available as students proceed through the program.*

YES NO

**The university has provided a signed statement from the Library Director verifying that the library volumes and serials available are sufficient to initiate the program.**

New College of Florida's Library Director attests that the library volumes and serials available are sufficient to initiate the program. In addition, to support the program additional resources will be allocated in the first year (\$4,381) and the same amount in the fifth year for library expenses. The funds will be made available from E&G funds.

**The university has ensured that the physical space necessary for the proposed program, including classrooms, laboratories and office space, is sufficient to initiate the program.**

According to the proposal, instructional space is sufficient.

**The university has ensured that necessary equipment is available to initiate the program.**

According to the proposal, all the necessary equipment is available.

**The university has ensured that fellowships, scholarships, and graduate assistantships are sufficient to initiate the program.**

The proposal notes that the program will not provide scholarships or fellowships, however tuition waivers will be provided to members of the first class.

**If applicable, the university has ensured that the department has arranged a suitable number of clinical and internship sites.**

The proposal mentions a number of locations that have already been contacted and expressed support (in writing) for hosting paid practicum semesters for the NCF students. A few other locations will be contacted in the future.