

COASTAL CAROLINA UNIVERSITY

Conway, South Carolina

Program Planning Summary

Submitted to the

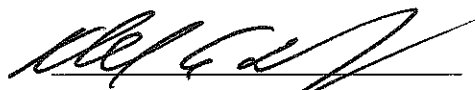
South Carolina Commission on Higher Education

To establish a

**Master of Science in
Information Security and Analytics**

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**Program Contact:
Dr. Sathish Kumar
Assistant Professor, Department of Computer Science
and Information Systems
College of Science
skumar@coastal.edu
(843) 349-2810**



**David A. DeCenzo
President**

CLASSIFICATION

Program Title:	M.S., in Information Security and Analytics
Designation, Type, and Level:	Master of Science.; two-year graduate degree
Proposed Date of Implementation:	Fall 2015
CIP Code:	11.1003
Supplemental Palmetto Fellows Scholarship and LIFE Scholarship:	No
Delivery Mode:	Online Instruction

JUSTIFICATION

Need for the Program in the State: The proposed Master of Science in Information Security and Analytics meets the unique needs of individuals seeking advancement in an existing career and /or a course of study, or entry into careers in information security and data analytics. The program will include the theory and principles, as well as the design and development of, practical applications that satisfy most users' information security and data analytics needs. It will prepare graduates to secure computer information systems and technology and to derive knowledge/decisions from their data to solve problems in business, science, industry, government, and non-profit institutions. Graduates will be prepared to design, implement, manage, and evaluate secure technology systems and infrastructure, as well as to analyze, design and develop analytics infrastructure to discover knowledge and to make decisions. Graduates will also be prepared to pursue doctoral studies in security/analytics or in the various areas where these skills can be applied.

There will be a strong future growth of Information Industry experts, including security and analytics professionals. Between 2010 and 2020, it is expected that the need for information-related professionals will increase by 20% (South Carolina Department of Employment and Workforce, 2013). While this proposed program is not as broad as the M.S. in Computer Science, students are trained at an advanced level in *two* high growth areas: (1) Information Security and (2) Analytics. They will have a good opportunity for career growth in any one or both of these areas, while further pursuing their academic or industry career. Studies conducted over the last three decades by educational researchers have provided strong arguments supporting the potential to improve the professional preparation of students at the post-baccalaureate level (MacKinnon, 1984; Pitney WA, 2012; Wilkerson, Colston, & Bogdanowicz, 2006). Also, Information Security and Analytics concentrations are synergetic. For example, analytics can be used as a tool for improving security, and students can use protecting analytical infrastructure as a test bed for their further security training. They can then adapt that skill in protecting production analytics and operations infrastructure in the real world.

Relationship to Existing Programs at the Proposing Institution: Since 1986, Coastal Carolina University (CCU) has offered a B.S. in Computer Science (CS), and since 2010, it has offered a B.S. in Information Systems (IS). A new Bachelor of Science degree program in Information Technology (IT) is being planned to start next year. These current programs allow students to choose courses with either a theoretical emphasis or an information systems/information technology emphasis to complement a common core of foundational courses in computer science. The proposed program will require courses that are graduate versions of some of the courses currently being taught by the faculty in the areas of Computer Science and Information Systems, Politics and Geography, and Business Administration. This program will be designed to allow a student with a bachelor's degree in a related field to complete this Master's degree at Coastal Carolina University in approximately two years.

Assessment of Extent to Which Program Duplicates Existing Programs in the State: Although South Carolina public institutions provide some training, such as: (a) USC–Columbia, which offers a graduate *certificate* in information assurance and security, and (b) the College of Charleston, which offers an undergraduate degree program in data science, there is currently no information security or information analytics *master's* degree program in the state of South Carolina. This program is related to only a few master's programs in cybersecurity and/or information assurance and very few master's programs in data analytics programs *outside* of the state of South Carolina. None of these graduate programs outside of South Carolina has both the security and the analytics concentration in a single graduate program. Moreover, these programs are very different in terms of course requirements. Therefore, this proposed program does not constitute unnecessary duplication of programs in the state.

PROGRAM DEMAND AND PRODUCTIVITY

Several indicators suggest the demand for this graduate program will be strong. First, in a recent survey conducted by Coastal Carolina University's Office of Institutional Research, Assessment and Analysis, 114 current undergraduate students representing a cross-section of several different majors responded, and 70.17% (n = 80) of the respondents indicated they would either be interested in or would like to contemplate further pursuing this graduate program, if it were available. Second, enrollment growth in the University's current undergraduate program in Information Systems has been steady, growing to over 120 since its inception in 2010 with a compounded annual growth rate of 86.12%. Third, the overall expected national growth for the Information Security (35%) and the Data Analytics/ Scientist (15%) related occupations during the next decade will attract more students, in general, to the study of Information Security and Analytics (Bureau of Labor Statistics, 2012). The growth in participation rates, combined with the continued growth of the Information Security and Analytics related occupations, supports a future demand for trained individuals in information security and analytics. With the above indicators, the proposed Master's program should see steady enrollments.

The proposed program will provide needed opportunities for South Carolinians and/or current Coastal students to stay in-state to pursue graduate study in this discipline. Neighboring states currently have somewhat greater capacity to serve these students than does SC. For example, AL has two graduate programs in Information Security. While GA and VA have only one graduate program in Information Security, NC has one graduate program in Analytics. Comparatively, SC has no master's program in either information security or analytics but one graduate certificate program in Cybersecurity, with none being available in the eastern part of the state. Additionally, the need to provide current Coastal students with in-state graduate program opportunities intersects with the institution's current profile of out-of-state students. For example, students from NY, NJ, MD and PA account for approximately 26% of CCU's enrollment (2012, CCU Fact Book). None of these states offer *any* graduate program in Information Security or Information Analytics.

Given the documented high undergraduate student interest in the proposed Coastal program, it is logical to assume that, with the increase in the state's capacity to serve students in this discipline, some of Coastal's out-of-state students would opt to remain in SC for graduate study and contribute to the state's intellectual capital. The program may also attract SC residents who currently seek degrees in adjacent states with higher capacity (NC, AL, VA, and GA).

To summarize, based on our survey within/outside the department and within the university, by the student level and the study of the programs in the neighboring states, combined with the growth of the information security and analytics industry, anticipated conservative enrollment in the first year is 20, and anticipated number of annual completions after the first year is 10.

EMPLOYMENT OPPORTUNITIES FOR GRADUATES

While there is still a need for graduates in CS, IS and IT, there is a critical shortage of information security and analytics professionals who can understand, develop and maintain secure information systems/technology and analyze, evaluate, design and develop the data analytics system to make sense of this information for scientific and business needs. The demand for cyber security and information assurance experts is growing at 3.5 times the pace of the overall IT job market and 12 times the overall job market, due to a worsening barrage of online attacks against businesses and government agencies (Wall Street Journal, 2013). Also, it is expected that the cyber security and information assurance related jobs would grow about 22% between 2010 and 2020 (U.S. Department of Labor, 2012). Between 2012 and 2022, the data scientist/information analytics professional career path is projected to increase by more than 20% (Bureau of Labor Statistics, 2012). An estimated 1.5 million jobs in data analytics need to be filled in the next 5 years to meet the market demand (McKinsey Global Institute, 2013). Between 2010 and 2020, it is expected that the need for information related professionals, including information security and data analytics professionals in South Carolina is expected to increase by 20% (South Carolina Department of Employment and Workforce Report, 2013).

CURRICULUM

The proposed graduate program will require thirty (30) credit hours of total course work. The curriculum will include twelve (12) specific credit hours of core required course work, including: CSCI 560-Intro to Cybersecurity and Information Assurance, CSCI 561-Information Security Policy and Risk Management, CSCI 570-Data Management and Analytics, and CSCI 571-Data Mining and Knowledge Discovery. The remaining eighteen hours come from a limited list of elective choices which allow for some further specialization in cybersecurity, such as CSCI 660-Network and Internet Security, or CSCI 661-Mobile and Web Application Security, or CSCI 669-Sp. Topics in Information Security – Secure Cloud Computing, etc., as well as specialization in data analytics, such as CSCI 670-Business Intelligence and Analytics, CSCI 671-Data Fusion and Visualization, and CSCI 679-Sp. Topics in Information Analytics - Big Data Analytics, among others. In addition, this graduate program would be offered as *Thesis* (CSCI 680) or *Non-Thesis* option. The students who prefer a *Thesis* option would substitute six credit hours of thesis work for two three-hour elective courses.

ARTICULATION AND INTER-INSTITUTIONAL COOPERATION

CCU is open to establishing relationships with other institutions across the state, as they have the potential to serve as feeder programs for the proposed Master of Science degree in Information Security and Analytics. Coursework taken at other accredited programs would be open to review for transferability. Inter-Institutional cooperation currently exists with the undergraduate professional programs and would continue with this proposed program.

ESTIMATED COSTS

Assuming a modest growth in enrollment for the program, we anticipate the need for an additional faculty member in the future. For that reason, we will be looking to add one new faculty member to teach graduate courses as part of the program, or (if necessary) compensate the load of the existing faculty who would be released to teach the courses in the graduate program. The potential new hire will cost an estimated \$83,000-\$87,000 annually, including the annual salary and the overhead costs (office space, hardware/software equipment etc.,) of about \$10,000. The existing annual allotments for library monograph purchases for the department will be sufficient for expansion. The total estimated costs for this program are \$0 in year one, and \$83,000-\$87,000 in year two. Five year total cost is estimated to be around \$400,000. Costs for this new program will be covered by tuition generated by the program. No additional funds for this program are being requested from the state.