

**Request for Authorization to Establish a
Master of Science in Applied Data Analytics
(M.S., CIP 11.0802) at
Appalachian State University**

I. Program Highlights

- Designed to develop business professionals who understand and can apply data analytics concepts, techniques and tools to promote effective organizational decision-making and problem-solving
- Builds on existing graduate certificate in business analytics and business analytics concentration in the Master of Business Administration (M.B.A.) program
- 36 credit hours, possible to complete in one year
- Core content in business analytics, problem analysis and methods, visualization, forecasting and time series models, and project management
- Concentrations in Supply Chain Analytics, Sustainability Analytics, and Interdisciplinary Analytics
- 34 full-time and 4 part-time students projected at steady state
- Resource needs to launch the program include two full-time faculty by Year 4, funded almost entirely through internal reallocations, and graduate assistantships, supplies, travel, communications and software subscriptions funded through differential tuition. Appalachian State University (ASU) will request a differential tuition of \$3600 per student per academic year, which is comparable to existing differential tuition for ASU's M.B.A. and M.S. in Accounting.

II. BOG Academic Program Planning Criteria (UNC Policy 400.1)

1. **Existing Programs (Number, Location, Mode of Delivery).** North Carolina State University offers the M.S. in Analytics, and UNC Charlotte offers the M.S. in Data Science and Business Analytics. Both programs are offered on campus.
2. **Relation to Campus Distinctiveness and Mission.** The proposed program aligns with ASU's mission and vision to blend teaching and scholarship in rapidly emerging and needed fields and to offer distinctive, relevant graduate programs. The program also aligns directly with areas of strength and focus in the ASU strategic plan, *The Appalachian Experience: Envisioning a Just and Sustainable Future (2014-2019)*, including sustainability, responsiveness to geographic location, and a tradition of community and solving regional problems.
3. **Demand (Local, regional, state).** The rapid enrollment growth and large applicant pools of the two existing programs in UNC are evidence of student demand for analytics programs at the master's level. NC State reviewed over 1000 applications to ultimately enroll 115 in its class of 2016. UNC Charlotte's program, launched in 2014, already enrolls over 100 students.

ASU M.B.A. students hold undergraduate degrees in a wide variety of areas (42% business, 58% non-business). For that reason, ASU surveyed students across all undergraduate majors at ASU for their interest in the proposed program. Of those who indicated interest in graduate school (724), 60% (435) were somewhat to very interested in a graduate program in analytics at ASU.

APPENDIX O

ASU's existing M.B.A. program currently offers a business analytics concentration. The percentage of students electing that concentration has grown from 5% to 18% since 2014.

4. **Potential for Unnecessary Duplication.** The excess student demand experienced by NC State and UNC Charlotte, as well as data available from other programs nationally, eliminate concerns regarding unnecessary duplication.
5. **Employment Opportunities for Graduates.** The proposal cites numerous recent reports, including from McKinsey and Company, PricewaterhouseCoopers, and Accenture Analytics. These reports quantify the efforts of companies like Proctor and Gamble and U.S. Xpress to transform themselves into digital businesses ready to make rapid, data driven decisions. Some reports point specifically to supply chain analytics and sustainability analytics as areas with significant potential and where the management workforce requires additional depth. The U.S. Bureau of Labor further predicts a 24% increase in demand for business analysts in the next eight years. A search of NCWorks online postings in a 6-month period yielded over 1500 positions with the title *business analyst*, *data analyst*, or *business intelligence*; a December 2015 search of Indeed.com yielded over 2300 postings in North Carolina with the same titles. Members of ASU's Walker College of Business Advisory Council and advisory boards for computer information systems and supply chain management also provided letters of support indicating the need for the program. These members represent companies such as Transportation Insight, Bank of America, Appalachian Regional Healthcare System, and Highland Craftsmen, Inc.
6. **Faculty Quality and Number.** Twenty-three existing faculty, in areas as diverse as accounting, biology, computer information systems, economics, geography, mathematics, marketing, and healthcare management, will be directly involved in the proposed program.
7. **Availability of Campus Resources (library, space, etc.).** Library resources, facilities and information technology services are adequate to launch the program.
8. **Relevant Lower-level and Cognate Programs.** Students in any undergraduate major from an appropriately accredited program may apply to the proposed program. Students without the requisite undergraduate coursework for the proposed program may participate in the accelerated prerequisite program, *Ivy Software*, currently utilized successfully in the ASU M.B.A. program. *Ivy Software* is used by high quality business programs around the country, including the Wharton School at the University of Pennsylvania and the Darden School of Business at the University of Virginia.
9. **Impact on Access and Affordability.** The proposal included a chart of nearly 100 similar programs offered across the country, their tuition and program duration. Even with differential tuition, the ASU program remains a competitively priced program both within UNC and nationally.
10. **Expected Quality.** Employers have shown strong interest in hiring ASU M.B.A. students with the business analytics concentration. For example, recent graduates have been hired as data analysts, data scientists, market analysts or business analysts by companies such as Met Life, AdWords, and Grant Thornton LLP, with salary ranges of \$60,000-90,000, many with signing bonuses.

11. Feasibility of Collaborative Program. ASU has explored potential for collaborative course-sharing, research, grant-writing, and thesis mentoring with UNC Charlotte, UNC Greensboro, and UNC Wilmington. Strong potential exists for the proposed program to serve as pathway into the existing PhD in Information Systems at UNC Greensboro.

12. Other Considerations. None.

III. Summary of Review Processes

Campus Review Process and Feedback. The proposal was reviewed and unanimously approved by each of the following: College of Business Graduate Curriculum Committee; College of Business Executive Committee; Graduate Academic Policies and Procedures Committee. No substantive issues, concerns or opposition were raised that required revision to the proposal.

UNC General Administration Review Process and Feedback. Throughout the review process, ASU responded to questions from UNC General Administration regarding student demand, societal demand, faculty capacity, budget, curriculum requirements, and collaborative opportunities. The program was reviewed by faculty and graduate program administrators from ten UNC institutions. Reviewers consistently recognized and agreed that the societal demand for analytics programs and graduates is strong and expressed that the relatively modest enrollment projections and regional focus eliminated concerns of duplication. All reviewers found the proposal either “acceptable” or “acceptable with some considerations” in all of the categories they considered and ranked. While comments on the proposed curriculum were various and hence difficult to categorize, ASU provided a comprehensive response regarding their approach to the curriculum development and content. Several reviewers noted the implications of accepting students from any undergraduate major. In response, ASU reiterated the success of the use of the prerequisite software in the M.B.A. program while acknowledging that, as for any degree program, admissions standards and policies will be continuously monitored and adjusted as needed.

Benefits of program approval include an affordable option developed in response to an identified and growing need. For these reasons, we do not recommend any alternatives to implementing the degree program.

IV. Recommendation

It is recommended that the Board of Governors approve Appalachian State University’s request to establish a Master of Science (M.S.) in Applied Data Analytics degree program (CIP 11.0802) to enroll students starting Fall 2016.

**Request for Authorization to Establish a
Bachelor of Science in Business Administration in
Supply Chain Management
(B.S.B.A., CIP 52.0203) at
Appalachian State University**

I. Program Highlights

- Designed to prepare professionals who can contribute to organizational success through various aspects of supply chain management, including procurement, sourcing, logistics, manufacturing, distribution, and quality management
- 122 credit hours
- 15 hours core courses, including six sigma and global logistics, and 9 hours electives in supply chain management required
- Junior year internship elective strongly encouraged
- Builds upon successful supply chain management minor
- 150 full-time students projected at steady state
- No new courses, faculty, facilities, library or information technology supports are needed to launch the program at projected enrollments. Should enrollment grow beyond what is projected at steady state, then additional faculty would be needed.

II. BOG Academic Program Planning Criteria (UNC Policy 400.1)

1. **Existing Programs (Number, Location, Mode of Delivery).** Seven UNC institutions offer either majors, minors, or concentrations in supply chain or related content. East Carolina University, North Carolina State University, and UNC Wilmington offer concentrations in supply chain or operations management through their B.S. in Business Administration degree programs. UNC Charlotte also allows a student to major in Operations and Supply Chain Management through their B.S. in Business Administration degree program. NC A&T State University awards a B.S. in Supply Chain Management, and UNC Greensboro awards the B.S. in Information Systems and Supply Chain Management. Enrollments in these supply chain degree programs or concentrations have ranged from 50-200 students in recent academic years. ECU and UNCG offer significant portions of their degree program content online.
2. **Relation to Campus Distinctiveness and Mission.** One aspect of the Appalachian State University (ASU) mission is to “prepare students to lead purposeful lives as engaged global citizens who understand their responsibilities in creating a sustainable future for all.” The proposed program contributes to the ASU mission through its emphasis on the global context and the promotion of sustainability in business. The proposed program also directly aligns with four of six strategic directions in the institution’s current strategic plan.
3. **Demand (Local, regional, state).** About 200 students are currently enrolled in the supply chain management minor at ASU. Additionally, as noted in the response to #1 above, other UNC institutions with a similar degree program or concentration enjoy healthy enrollments. Current students in and alumni of the supply chain minor at ASU were surveyed in 2015 to determine levels of interest in the degree program. Of the eighty respondents, 79% indicated they would have selected this degree program if it were available, and 88% indicated future students would

be interested or extremely interested in this degree program. An increasing number of community colleges are also offering two-year degrees in supply chain, logistics, or transportation areas and are interested in establishing bilateral agreements for program articulation.

4. **Potential for Unnecessary Duplication.** Demand for supply chain management programming is high across other UNC system schools, and their reviews of the proposed program were positive and encouraging.
5. **Employment Opportunities for Graduates.** The proposal referenced twenty-six recent publications documenting the shortages in supply chain management professionals and the need for additional educational programs. For example, in 2014, *Supply Chain Quarterly* stated that, “unless current trends change, within the next few years there will be six available supply chain jobs for every one person qualified to fill them.” The U.S. Bureau of Labor Statistics predicts 22% growth in the number of logistics and supply chain analysts from 2012-2022, with a median salary of \$72,780. More locally, through ASU’s subscription to the NACELink job posting service, 5-10 new companies have contacted ASU in each of the past few years seeking graduates with supply chain management skills. Students in the ASU supply chain minor have received job offers from companies such as Technibilt, Infinity Global, Bank of America, Georgia Pacific, Ralph Lauren, Target, Daimler Trucks North America LLC, Family Dollar, and many others. Fifteen executives in operations, supply chain, and global sourcing roles provided letters of support for the proposed program, including from MHI, C.H. Robinson, and Belk.
6. **Faculty Quality and Number.** Five existing faculty will teach in the proposed program and already support the nearly 200 students enrolled in the supply chain minor at ASU. Three of the five have considerable supply chain management industry experience and teach the core courses. Additionally, at the time the proposal was written, a search was underway to replace one faculty who retired and to add another faculty approved to support recent growth. This core of faculty will be able to support the projected enrollment.
7. **Availability of Campus Resources (library, space, etc.).** Library resources, classroom facilities, and information technology supports are adequate to launch the program.
8. **Relevant Lower-level and Cognate Programs.** All courses for the proposed program are already in place and serving a high-enrolled undergraduate minor in supply chain management.
9. **Impact on Access and Affordability.** By building on an already popular minor at ASU, the proposed program provides an affordable opportunity for interested students to gain additional depth in a growing field.
10. **Expected Quality.** The fifteen letters of support included with the proposal indicate broad endorsement of the proposed program by ASU’s regional and business community.
11. **Feasibility of Collaborative Program.** The proposed program is intended to serve a resident undergraduate student population through face-to-face instruction, although plans exist to develop, at minimum, the core courses for online delivery. ASU has pursued several conversations with regional community colleges regarding possible collaborations with two-year feeder programs into this proposed degree program.

- 12. Other Considerations.** Over 50 students in the supply chain management minor are actively participating in the Appalachian Supply Chain Club (ASCC), sponsored by the Foothills chapter of the national association of operations managers. The club provides opportunities for students to network for jobs and internships and to attend the professional meetings of these organizations. ASU students in the ASCC currently make up 44% of the local Foothills chapter membership.

III. Summary of Review Processes

Campus Review Process and Feedback. The proposal was reviewed and unanimously approved by each of the following: Computer Information Systems and Supply Chain Management Department; Walker College of Business Undergraduate Curriculum Committee; Walker College of Business Executive Committee; Appalachian State University Dean's Council; Undergraduate Academic Policies and Procedures Committee. No substantive issues, concerns or opposition were raised that required substantive revision to the proposal.

UNC General Administration Review Process and Feedback. Throughout the review process, ASU responded to questions from UNC General Administration regarding student demand, societal demand, and program evaluation. The program was reviewed by faculty and graduate program administrators from three UNC institutions. All reviews in every response category were either "acceptable" or "acceptable with some considerations." One institution with a supply chain management degree program indicated its enrollments were modest until it began offering the program online three years ago. The reviewer acknowledged, however, that ASU had identified a demographic with a strong preference for face-to-face learning and was supportive of the proposal. ASU confirmed their evidence of demand for face-to-face instruction while acknowledging that they will continue to investigate how best to meet student needs through the proposed program.

Benefits of program approval include a low cost opportunity to meet an industry-identified need. For these reasons, we do not recommend any alternatives to implementing the degree program.

IV. Recommendation

It is recommended that the Board of Governors approve Appalachian State University's request to establish a Bachelor of Science in Business Administration (B.S.B.A.) in Supply Chain Analytics degree program (CIP 52.0203) to enroll students starting Fall 2016.