

Aminta H. Breaux, Ph.D.

President

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July 24, 2020

James D. Fielder, Jr. Ph.D. Secretary of Higher Education Maryland Higher Education Commission 6 North Liberty Street Baltimore MD 21201

RE: Substantial Program Modification – New Area of Concentration in Data Analytics within the Bachelor of Science in Business Administration existing program.

Dear Secretary Fielder.

Please find enclosed Bowie State University's substantial modification of the existing Bachelor of Science in Business Administration program (HEGIS 050601/CIP 520201) to offer a new area of concentration (AOC) in Data Analytics.

Bowie State University developed the proposed AOC in Data Analytics in response to changing workforce demands of business administration graduates. The proposed Data Analytics AOC will provide a solid grounding in fundamental of data science and analytics, programming, data visualization, predictive analytics and working with big data.

The AOC in Data Analytics curriculum was developed using the multi-disciplinary framework for Data Science and Analytics developed under the National Science Foundation (NSF) grant. In 2018, the Management Information Systems (MIS) and Accounting Finance and Economics (AFE) Departments in collaboration with Natural Science and Computer and Technology departments received three-year, \$400,000 dollars NSF Grant to Infuse Data Science and Analytics in the Undergraduate Curriculum at Bowie State University. In addition, the College of Business has been adding new faculty and providing additional professional development to current faculty to support this concentration.

We respectfully request the Commission's consideration of this proposal.

Sincerely.

Aminta H. Breaux, Ph.D. President

 Cc: Dr. Judith Kirkpatrick, Interim Provost and Vice President for Academic Affairs Dr. Antoinette Coleman, Associate Vice Chancellor, USM
 Dr. Lawrence McNeil, Dean, College of Business
 Dr. Azene Zenebe, Department Chair, Management Information Systems
 Dr. Latanya Brown-Robertson, Professor, Accounting, Finance & Economics
 Ms. Gayle Fink, Office of Planning, Analysis and Accountability



Cover Sheet for In-State Institutions New Program or Substantial Modification to Existing Program

Institution Submitting Proposal	Bowie State University
Each action	below requires a separate proposal and cover sheet.
O New Academic Program	O Substantial Change to a Degree Program
• New Area of Concentration	O Cooperative Degree Program
O New Degree Level Approval	O Off Campus Program
O New Stand-Alone Certificate	O Offer Program at Regional Higher Education Ctr.

Department Proposing Program	Management Information Systems, College of Business										
Degree Level and Degree Type	BS in Business Administration	BS in Business Administration									
Title of Proposed Program	AOC in Data Analytics										
Total Number of Credits	24 120 A.Z.										
Suggested Codes	HEGIS: 50601	CIP: 520201									
Program Modality	On-campus O Distance Ed	ucation (fully online) O Both									
Program Resources	• Using Existing Resources	C Requiring New Resources									
Projected Implementation Date	O Fall O Spring O	Summer Year: 2021									
Provide Link to Most Recent Academic Catalog	URL: http://catalog.bowies	state.edu/									
	Name: Dr. Azene Zenebe										
Proformed Contact for this Proposal	Title: Department Chair and Profess	or									
referred Contact for this Proposal	Phone: (301) 860-3641										
	Email: azenebe@bowiestate.edu										
President/Chief Executive	Type Name: Dr. Aminta H. Breaux	1									
riesideni/Chief Executive	Signature:	Date: 7-21-20									
Approval/Endorsement	Type Name:										
by Governing Board	Signature:	Date:									

Revised 5/7/18

MARYLAND HIGHER EDUCATION COMMISSION 6 N. Liberty Street • 10th Floor • Baltimore, MD 21201 T 410,767.3300 • 800.974.0203 • F 410.332.0270 • TTY for the Deaf 800,735.2258 <u>www.mhec.maryland.gov</u>

UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

New Instructional Program

- X Substantial Expansion/Major Modification
- Cooperative Degree Program
- X Within Existing Resources, or
 - Requiring New Resources

Bowie State University Institution Submitting Proposal

Business Administration – Data Analytics Concentration Title of Proposed Program

Bachelor of Science Award to be Offered Spring 2021
Projected Implementation Date

050601

Proposed HEGIS Code

52.0201 Proposed CIP Code

College of Business Management Information Systems & Accounting, Finance and Economics Department in which program will be located

Dr. Azene Zenebe Dr. Latanya Brown-Robertson Department Contact

301-860-3594 301-860-3641

Contact Phone Number

Signature of President or Designee

azenebe@bowiestate.edu lnbrown@bowiestate.edu

Contact E-Mail Address

7.21.202

Date

Bowie State University Bachelor of Science in Business Administration, Data Analytics Concentration

A. Centrality to Institutional Mission and Planning Priorities:

Bowie State University (BSU) is a comprehensive university that provides 21st-century learners with a strong foundation for success with a well-rounded academic experience, an inclusive environment, and hands-on learning opportunities. Building on its rich legacy as a training ground for teachers since 1865, the university is committed to providing access to a high-quality education and cultivating emerging leaders who are prepared to succeed in a changing, global society.

The proposed area of concentration in Data Analytics (AOC-DA) within the Bachelor of Science in Business Administration program aims to educate and train undergraduate students in data analytics. The proposed concentration focuses on teaching data management and data analytic applications for problem solving and decision support using information technology. In an analysis of job growth in this field, Price Waterhouse Cooper (2017) highlights that majority of the job growth (30 to 50%) came directly from the data science and analytic-enabled jobs such as Data-Driven Managers and Functional Analysts compared to the data scientist jobs, such as Data Engineers and Data Scientist. The undergraduate Business Administration program is approved by the Accreditation Council for Business Schools and Programs (ACBSP).

The curriculum for AOC-DA was developed using the multi-disciplinary framework for data science and analytics developed under the National Science Foundation (NSF) grant. In 2018, the Management Information Systems (MIS) and Accounting Finance and Economics (AFE) Departments in collaboration with Natural Science and Computer Science departments received a three-year, \$400,000 NSF Grant to Infuse Data Science and Analytics in the Undergraduate Curriculum (DSA) at Bowie State University. The grant work provided a foundation for this new AOC, as did feedback from the Data Science and Analytics Faculty Learning Community (DSA FLC), the DSA Advisory Board, and the DSA undergraduate research program.

The Business Administration program with a concentration in Data Analytics will have a total of 45 credits as general education requirements, 51 credits as business core requirements and 24 credits as Data Analytics concentration requirements. The Data Analytics concentration requirements include one fundamental course, four required courses and one capstone course, and two elective courses. The College of Business, Management Information Systems (MIS) Department will provide oversite for concentration.

The proposed AOC-DA contributes to the university's mission by empowering "a diverse population of students to reach their potential by providing innovative academic programs" and by supporting Maryland's workforce and economy. The Data Analytics concentration contributes to the achievement of Bowie's FY 2019 - FY 2024 Racing to Excellence Strategic Plan, specifically Goal 1 Academic Excellence, Objective 1.1 High-demand, innovative academic programs.

Specifically, the proposed AOC-DA aims to educate and train undergraduate students to fill the existing data analytics talents gap in the nation in all data science and analytics-enabled jobs, and the data analyst and data engineering jobs. In addition to the wide talent gap, there is also a national need for a more diverse data science and analytical workforce. According to the General Assembly (2017) out of the total data analytics workforce, only 35.5 percent are women, and 4 percent are African-American (General Assembly , 2017). Bowie State University is ideal for providing this as most data analytics students will be from the underrepresented population, including women and minorities.

The proposed AOC-DA will be supported by current levels of human resources and minimal additional out-year fiscal resources. Presently, the Business Administration program has provided additional training to five MIS Instructors, four Economics and two Finance Instructors to teach the courses within the concentration. Along with the existing faculty, in fall 2019 the Accounting Finance and Economics area hired an Assistant Professor in Economics with skills in Data Science and Analytics and an Assistant Professor in Data Analytics who will coordinate and oversee the growth of the concentration. Additional supports are anticipated through corporate relationships with the Price Waterhouse Cooper, Incapsulate, AWS and IBM.

B. Critical and Compelling Regional or State wide Need as Identified in the State Plan:

Data (big or small) analytics is an emerging discipline, which is becoming ubiquitous and essential to the economy as 'oil' and 'gold.' As a result, more and more employers require foundational knowledge and application of data analytics and data science processes. Many disciplines such as economics, chemistry, biology, psychology, and health sciences are data-driven. Knowledge and application of data science and analytics (that involves data understanding, data management, and data analysis) for the advancement of various disciplines by analyzing big data to provide solutions to discipline-specific problems is in its infancy. Hence, there exists a need for the advancement of knowledge in data science and analytics and its applications in many of these diverse disciplines.

The 2017-2021 Maryland State Plan for Postsecondary Education: Student Success with Less Debt Strategy 4 focuses on equal educational opportunities for Marylanders. Under this strategy, the plan calls for continued support for Historically Black Colleges and Universities. The proposed area of concentration is well aligned to the following goals, strategies and action items of the 2017-2021 Maryland State Plan for Postsecondary Education: SUCCESS: Promote and implement practices and policies that will ensure student success – Strategy 4,5,6 and INNOVATION: Foster innovation in all aspects of Maryland higher education to improve access and student success – Strategy 8.

Data analytics and data mining are two of the innovative industries and academic studies for the 21st century (Maryland Higher Education Commission MHEC, 2017). Other data science and analytics related fields closely followed such as artificial intelligence, bioinformatics, biotechnology, biopharma, cybersecurity, entrepreneurship, informational technology, nanotechnology, modern manufacturing, and robotics.

C. Quantifiable and Reliable Evidence and Documentation of Market Supply and Demand in the Region and State:

Graduates from the proposed concentration will be prepared for entry-level management and in analytic professional positions. Graduates will have employment opportunities in several industries including financial, healthcare, retail, technology, scientific, and manufacturing, as indicated in Figure 1 (PwC, 2017). In May 2019, the Harvey Nash CIO Survey found that the demand for data analytic skills was voted among CIOs as number one in the top five most scare skilled jobs (Harney Nash KPMG, 2019).



Figure 1. Demand for Data Analytic Related Skills

The demand is for business people with analytics skills, not just data scientists Of 2.35 million job postings in the US

Notes: Job category of analytics managers not shown. Totals may not equal 100%. Source: PwC analysis based on Burning Glass Technologies data, January 2017. Number of postings: Finance and Insurance (535,683); Healthcare and Social Assistance (100,000); Information (690,833); Manufacturing (237,484); Professional, Scientific, and Technical Services (511,947); Retail Trade (101,711).

The demand for data analytics positions is high. The McKinsey Global Institute describes data analytics as "the next frontier for innovation." "The United States alone could face a shortage of 140,000 to 190,000 people with strong analytical skills as well as 1.5 million managers and analysts with the know-how to use the analysis of big data to make effective decisions." (McKinsey Global Institute, 2011). In 2017, Price Waterhouse and Cooper (2017) analyzed 2.35 million US job postings. The findings revealed two prominent job categories: analytics-enabled and data science jobs. Price Waterhouse Cooper (2017) study also discovered that majority of the job growth (30 to 50%) came directly from the DSA-enabled jobs such as Data-Driven Managers and Functional Analysts compared to the Data Scientist jobs, such as Data Engineers and Data Scientist as presented in Figure 1. These findings justify the importance of the proposed AOC to be focusing on data processing and management as well as on applications and problem solving.

According Fitzgerald et al (2016), by the year 2021, nearly 70 percent of employers indicate they will prefer job candidates with data science and analytics skills over ones without, whereas only 23 percent of educators indicate that their graduates will have data science and analytics skills as indicated in Figure 2 (PwC, 2017). This indicates a great gap in supply of graduates in data science and analytics skills.



Figure 2. Supply and Demand for Data Science and Analytics by 2021

Data science and analytics skills, by 2021

How will employers fill the talent pipeline?

Base: Higher education: 127; Business: 63 Source: Gallup and BHEF, Data Science and Analytics Higher Education Survey (December 2016).

The occupational outlook by the Bureau of Labor Statistics projects from 2014-2024 operations research analyst positions will increase to 45,000 compared to the 15,000 for statisticians. Management analyst positions are projected to grow by 208,000, market research analysts and marketing specialists will increase by 151,000. Job opportunities for financial analysts will grow by 89,000 and economists will increase by 7,000. Computer and information systems managers project an outlook of 95,000, and 498,000 for accountants and auditors (Bureau of Labor Statistics BLS, 2016)

Furthermore, according to the forecast of the World Economic Forum, by 2020 data analysts will be in high demand in companies around the world (Centre for the New Economy and Society, 2018). A recent LinkedIn Workforce Report maintains that, in the USA, demand for these professional figures has grown six-fold compared to five years ago, and data analysts will continue to be the most sought-after profiles over the next five years (LinkedIn Economic Graph Team, 2019). In addition, the average yearly salary of a data analyst is among the very highest in the broader labor market (Congressional Research Service, 2019).

Table 1 outlines potential job opportunities for students who complete the Data Analytics concentration along with job outlook projections for the State of Maryland.

Maryland Department of Labor - Maryland Long-Term											
Occupational Pro	Occupational Projections (2016 – 2026) Bachelor's Degree Educational level										
	Educat	ional level									
Occupation	2016	2026	Change	Pct Change							
Management											
Analysts	22475	23772	1297	5.77%							
Computer and											
Information											
Systems Managers	8979	9544	565	6.29%							
Information											
Security Analysts	3494	3760	266	7.61%							
	244	245		0.000							
Financial Examiners	344	345	1	0.29%							
Financial Specialists											
Financial Specialists,	1998	5071	73	1 46%							
Forensic Science	4778	5071	13	1.4070							
Technicians	444	474	30	6.76%							
Securities											
Commodities, and											
Financial Services											
Sales Agents	3289	3537	248	7.54%							
Market Research											
Analysts and											
Marketing											
Specialists	9914	10652	738	7.44%							
Budget Analysts	2276	2360	84	3.69%							
Credit Analysts	982	1040	58	5.91%							
Financial Analysts	6444	6952	508	7.88%							
Computer Systems	14050	1,000	1120	7.5.00							
Analysts Detekses	14950	16080	1130	7.36%							
Database Administrators	3553	3820	267	7 51%							
Operations	5555	3820	207	7.3170							
Research Analysts	3092	3266	174	5.63%							
Social Science	5072	2200	1/4	2.0270							
Research Assistants	743	822	79	10.63%							
Statistical Assistants	194	208	14	7.22%							

 Table 1. Long Term Occupational Projections for Data Analytic related positions

A review of the Maryland Higher Education Commission's listing of academic programs indicates that only 15 degree and certificate programs in analytics exist within the State of Maryland. Of these fifteen degrees and certificates programs, only one program offered a bachelor's degree in the area of Business Analytics, two programs offered a lower division certificate and four programs offered Post Baccalaureate certificates in some form of the analytics domain. University of Maryland College Park has a bachelor's degree in Operation Management and Business Analytics, however the program's enrollment and graduation data were not found in the MHEC database. The Bachelor's Program in Business Analytics at Capital Technology University was approved in 2017 and received its first cohort of three students in 2018 (graduation data is not available for this program yet). Overall analytics program graduates in the State of Maryland, regardless of degree areas, peaked in 2016 growing from 54 graduates to over 2,100 graduates. Since 2016, analytics programs experienced a 4 percent average annual growth in graduates. To meet the demand of this industry outlined earlier, analytics program graduates in Maryland must significantly grow at rate higher than 4 percent.

D. Reasonableness of Program Duplication

Table 2 presents a summary of the undergraduate level programs and graduate level programs in Maryland. The two bachelor level programs that are like the proposed Data Analytics program are at Capital Technology University and University of Maryland College Park. The two bachelor-level programs that are similar to the proposed Data Analytics concentration at BSU are from Capital Technology University and College Park. All cover analytics but with different areas of focus. The BSU Data Analytics concentration offers students in-depth knowledge and skills in data management including data extraction, transformation, cleaning and loading; in data analytics methods and processes; in visualization; in big data and analytics; and in applications of machine learning. The Business Analytics programs at College Park and Capital College offer students mainly the data analysis skills infused in the areas of Management and Business.

BSU's proposed program serves a different demographic and economic group with a primary focus on minorities, which is an important need to fill in STEM and STEM related fields. The AOC-DA is unique as it focuses on producing graduates for data analytics-enabled jobs in business domains.

School Name	Degree Level	Program Name
Capitol Technology University	BACHELORS	BUSINESS ANALYTICS & DATA SCIENCE
Univ. of MD, College Park	BACHELOR	Operations Management and Analytics (formally Operations Management)
Capitol Technology University	DOCTORATE(RESEARCH & SCHOLARSHIP)	BUSINESS ANALYTICS & DECISION SCIEN
Anne Arundel Community College	LOWER DIVISION CERTIFICATE	INTELLIGENCE ANALYTICS
Anne Arundel Community College	LOWER DIVISION CERTIFICATE	INTELLIGENCE ANALYTICS
Capitol Technology University	MASTERS	BUSINESS ANALYTICS & DATA SCIENCE -
Johns Hopkins University	MASTERS	BUSINESS ANALYTICS & RISK MNGT
Notre Dame of Maryland University	MASTERS	ANALYTICS
Univ. of MD Global Campus	MASTERS	DATA ANALYTICS
Univ. of MD, College Park	MASTERS	BUSINESS ANALYTICS
Univ. of MD, College Park	MASTERS	MARKETING ANALYTICS

Table 2. The undergraduate level programs and graduate level programs

School Name	Degree Level	Program Name
Johns Hopkins University	POST BACCALAUREATE CERTIFICATE	GOVERNMENT ANALYTICS
McDaniel College	POST BACCALAUREATE CERTIFICATE	DATA ANALYTICS
Univ. of MD University College	POST BACCALAUREATE CERTIFICATE	FOUNDATIONS IN BUSINESS ANALYTICS
Univ. of MD University College	POST BACCALAUREATE CERTIFICATE	PREDICTIVE ANALYTICS

E. Relevance to High-demand Programs at Historically Black Institutions (HBIs)

The proposed area of concentration continues Bowie State University's founding commitment to provide access and opportunity to diverse populations. The NSF award used to develop the curriculum aligned with Bowie's founding commitment to academic excellence.

F. Relevance to the identity of Historically Black Institutions (HBIs)

The proposed concentration will have significant impact on fulfilling the call for high-demand programs at HBIs. As cited previously, in 2017, the General Assembly found that out of the total data sscience and analytics workforce only 35.5 percent were women and 4 percent were African-American.

The Data Analytics concentration in the Business Administration program at Bowie State University supports the University's mission to empower a diverse population of students to function effectively in a highly technical, data-driven and dynamic global community.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes (as outlined in COMAR 13B.02.03.10):

 The curriculum was developed using the multi-disciplinary Data Science and Analytics Framework developed through the BSU NSF grant. In 2018 BSU, with collaborative work by faculty from the MIS, AFE, Natural Sciences and Computer Science departments, received a \$400,000, three-year NSF Grant to infuse data science and analytics in the undergraduate curriculum at Bowie State University. This grant enabled the formation of a successful Faculty Learning Community (FLC) of Faculty from Accounting, Finance, Economics, Psychology, Criminal Justice, Management Information Systems, Computer Science, Computer Technology, and Natural Sciences. Through this Faculty Learning Community, faculty development opportunities, research and collaboration, teaching modules development and implementation/delivery have grown since summer 2018.

The lead team for the development of the program consists of Dr. Brown-Robertson (PI), Co-PIs (Drs. Zenebe and Ntombi) of the grant, and they have recently been joined by a newly hired Data Analytics faculty member (Dr. Obiedat). The proposed AOC was prepared and presented to the DSA FLC, advisory board including BSU alumni, and students. After the lead team gathered feedback and made improvements to the program proposal, both the MIS faculty and Curriculum Committee, AFE faculty and Curriculum Committee, and College of Business Curriculum Committee reviewed and provided feedback and approval. Furthermore, the University Curriculum Committee and Faculty Senate reviewed and provided feedback and approval.

The Data Analytics Concentration will be housed in the College of Business (CoB) and placed under the MIS department. During the fall of 2019, the CoB received a new PIN and hired a Data Analytics faculty with dual position at MIS and AFE departments to be the coordinator of the program. The Data Analytics Concentration Coordinator will oversee the program and work with the Economics Concentration Coordinator, Information Systems Concentration Coordinator, and other coordinators of undergraduate programs in recruitment, enrollment, course scheduling and offerings, teaching and advisement as well as in other extra curricula activities.

The Data Analytics Concentration will be delivered in face-to-face modality.

- 2. The AOC in DA was modeled on the National Consortium on Data Science three dimensions of data science, which include data flow, data curative, and data analytics (Ahalt, 2012). The Data Analytics Concentration goals are:
 - Produce graduates with strong knowledge and Skills of data science and analytics' theories, methods, models, process, technologies and tools.
 - Produce graduates who will be able to solve local, national and global problems using big data and analytics.
 - Produce graduates with strong problem-solving skills.
 - Produce graduates with strong critical thinking and analytical skills.
 - Produce graduates who will create new business and innovative solutions using advanced and emerging data analytics techniques and technologies.
 - Produce graduates who can effectively tell-stories from the results of analytics using oral, written and visual forms of communication.

The expected learning outcomes for the Data Analytics Concentration expected learning are:

- Able to give examples and explain the role of big data for discovery of solutions for realworld problems.
- Able to explain the data science and analytics theories, methods, models and process.
- Able to explain big data and its applications.
- Able to apply data management principles relating to data representation, storage, retrieval and analysis: Able to prepare data-big or small-for analysis for a given problem.
- Able to develop model-based solutions for a given problem with datasets using statistical techniques and machine learning techniques.
- Able to evaluate model-based solutions for a given problem with datasets using statistical techniques and machine learning techniques.
- Able to present and communicate outcomes of analytics visually.
- Able to demonstrate critical thinking skills associated with problem identification, problem solving and decision-making using data and analytics.
- 3. The proposed area of concentration will follow the College of Business student learning outcomes assessment protocols that support ACBSP accreditation. Assessment results are

compiled by program faculty each semester and managed by the Program Chair and the Assessment Coordinator. The data is required to be reported to the BSU's Center for Academic Programs Assessment each year for review by internal peer evaluators. The full academic program review occurs every seven years in accordance with internal requirements and those of the University System of Maryland. Faculty members are evaluated annually according to parameters in the Faculty Handbook and BSU Policies and Procedures. Student course evaluations are administered each semester by the Office of Planning, Analysis and Accountability. Course evaluation results are shared with deans, department chairs and faculty to inform course and instructional improvements.

Like all College of Business concentration programs at Bowie State University, the Data Analytics concentration will undergo bi-annual assessment of the learning outcomes to assess student achievement and implement program interventions. ACBSP requires that assessment findings be publicly available on the program's website.

4. The Data Analytics concentration requirements include 1 pre-requisite course to be used as a general free elective, 1 fundamental course, 4 required courses and a capstone course, and 2 elective courses, i.e., total of 8 three credit courses (24 credit hours). A listing of the concentration courses is provided in Table 3 and the course descriptions are included immediately thereafter. Computer Applications for Business (BUIS 260) is pre-requisite before beginning the concentration sequence of courses. Other computer science or computer technology courses maybe substituted to satisfy concentration requirements.

Credits	Course	Course Title								
Pre-requi	isite Course									
3	3 DANL 280* Fundamentals of data science and analytics (Prereq: BUIS 260)									
Foundatio	onal Course (3 cre	edits)								
3	BUIS 305	A Programming Course (Prereq. BUIS 260)								
Core Req	uirements (15 cre	dits)								
3	BUIS 362	Database for Business (Prereq. BUIS 260)								
		Visualization and Visual Analytics (Prereq. DANL 280, ECON								
3	DANL 340*	350, BUIS 362)								
3	BUIS 462**	Decision Science and Analytics (Prereq. BUIS 362)								
3	DANL 480*	Big Data Analytics (Prereq. BUIS 462)								
3	DANL 490*	Capstone (Prereq. BUIS 462, DANL 480)								
Electives	(6 credits)									
3	DANL Elective									
3	DANL Elective									

 Table 3. Data Analytics Concentration Courses

* New course

^{**} Revised course

Pre-requisite course for the Concentration

DANL 280 - Fundamentals of data science and analytics (New Course) Prerequisite: BUIS 260 - Computers application or an equivalent course

Course description: This course is a foundation, which will help students gain a deeper understanding into data types and structures, tools, big data sources, data science process (data flow, data curative, and data analytics) as well as the associated ethics and challenges such as availability, reliability/quality, privacy and security. The course also introduces data analytics and student will solve business problems using data analysis applications such as spreadsheets and Tableau. This course will be used to satisfy the general elective requirement.

Foundational Course for the Concentration

BUIS 305 - Object Oriented Programming Prerequisite: BUIS 260 - Computers application or an equivalent course

Course Description: This course introduces students to the object-oriented (OO) approach to programming with emphasis on solving business problems. Proper object-oriented design principles and practices are emphasized throughout the course, beginning with a language independent introduction to logic using object-oriented principles. Students will be introduced to key programming concepts, including structure, decision making, looping, arrays, and files, and the importance of enforcing good style, modern conventions, and logical thinking. Students will learn to write and test Java coded programs using an open source Java IDE (Integrated Development Environment), working both individually and collaboratively on projects, based on real world examples.

Core Courses

BUIS 362: Database for Business Prerequisite: BUIS 260 - Computers application or an equivalent course

Course Description: Prerequisite(s): BUIS 260. This course provides an understanding of how data resources can be managed to support decision-making within organizations. It will examine the use, development, and implementation of organizational databases and how the database environment is used to support decision-making. Database design and implementation issues will be addressed from both a conceptual, logical and physical perspectives. In addition, data warehouse, big data concepts and technology will be covered. SQL is covered in depth.

DANL 340 - Visualization and Visual Analytics (New Course) Prerequisites: DANL 280, ECON 351 and BUIS 362

Course Description: This course focuses on descriptive analytics and covers design principles, methods, techniques and tools for visualization of data, information and/or knowledge from various sources and in various domain areas including natural sciences, information systems, cybersecurity, businesses and social sciences. The course also covers visual analytics techniques, tools and their applications.

BUIS 462 – Decision Science and Analytics Prerequisite: BUIS 362

Course Description: First the course provides foundation knowledge on decision making process and decision science. Then the course focuses on Predicative Analytics and covers the data mining (DM) processes for discovering patterns from both structured and unstructured data, and machine learning (ML) approaches, techniques, algorithms and their applications. It focuses on the applications of DM and ML for scientific and business problem solving using

Machine Learning Software and/or Machine Learning libraries available in Python, R or other programming language. A project is required.

DANL 480 - Big Data Analytics (New Course) Prerequisite: BUIS 462 Course Description: The course provides in depth coverage of the methods, tools, and applications used to extract and analyze big data with a focus on solving real world problems such as uncover hidden patterns, correlations and other insightful relationships. This course covers the technologies and tools used to store, retrieve and process big data. Other topics covered in the courses are text analytics, sentiment analysis, text mining, web analytics, streaming or real-time data analytics, network analytics, temporal and geospatial data analytics. A project is required.

DANL 490 - Capstone in Data Analytics (New Course) Pre-requisites: BUIS 462 and DANL 340

Course description: In this capstone project, students use data science and analytic knowledge and skill sets to solve a real-world problem. During the semester students will turn-in key parts of their data analytics project to the course instructor. Pending the course instructor's approval, students may also seek additional feedback from an instructor that specializes in the specific domain of their project. Students are expected to present the project report to demonstrate the quality of their solutions - dashboards, Business Intelligence (BI) reports, models, etc., and their proficiency in the field of data analytics. Successful students will also can earn a University System of Maryland Problem Solver Badge.

<u>Elective Courses (2 courses, 6 credit hours)</u> Current AOC-DA electives are listed in **Appendix A.**

- 5. Students in this concentration will satisfy general education requirements by taking 100-level and 200-level courses required of all Bowie State University students per the BSU catalog. See Sequence Chart in the **Appendix B** for the degree requirements.
- 6. Not applicable
- 7. Not applicable
- 8. As previously stated, the BS in Business Administration program is accredited by ACBSP. ACBSP and Middle States regional accreditation require public disclosure regarding the curriculum, course and degree requirements, faculty/student interaction, technology competence and skills, technical equipment requirements, learning management system, availability of academic support services and financial aid resources, and costs and payment policies. The primary sources of this information are the University website, the College of Business website and the BSU undergraduate catalog.
- 9. The Bowie State University's administration and the Chairs of the Department of Management Information Systems and the Department of Accounting, Finance & Economics provide their assurance that advertising, recruiting, and admission materials will clearly and accurately represent the proposed program and the services available. Departments do not represent their programs in any manner other than what is approved by the BSU President and MHEC. If approved, this program will be represented to current and potential students precisely in

accordance with program goals, courses, facilities, and services set out by this proposal and BSU administration directives pertaining to all programs. Current programs offered by the College of Business have always followed this exacting standard of accurate representation to students.

H. Adequacy of Articulation

Not Applicable

I. Adequacy of Faculty Resources (as outlined in COMAR 13B.02.03.11).

Currently, the Business Administration Program has five MIS Instructors, 4 Economics Instructors and 2 Finance Instructors who are adequately trained to teach the courses within the concentration. Along with the existing faculty the Accounting Finance and Economics area will hire by fall 2019 an Assistant Professor in Economics with skills in data science and analytics and an Assistant/Associate Professor in Data Analytics who will be involved in the growth of the program. The MIS program hired one additional MIS Assistant Professor to teach in this discipline.

Most Faculty listed above are members of the Bowie State University's Initiative to Infuse Data Science Analytics (DSA) into the Undergraduate Curriculum. Since the summer of 2018, these faculty above have received training, certificates and badging through IBM Cognitive Class environment, attended monthly Faculty Learning Community Sessions (online and face to face) to discuss DSA knowledge, best practices and pedagogy infusion techniques. Faculty have also attended workshops on Machine Learning and PwC's Tableau workshop as well as Big Data Education Conference in DC. Faculty also have been engaged in DSA research and publishing. These activities and many more will continue to be a part of BSU DSA Initiative for faculty. Along with the DSA Initiative, faculty are also required to attend at the Faculty Institute beginning of each semester workshops focusing on pedagogy sponsored by the Center for Excellence and Teaching and Learning.

BSU offers yearly Blackboard LMS training. Currently, many faculty in the College of Business are undergoing Quality Matters review of online and hybrid courses.

Faculty Member's	Appointment	Degree		Academic		
Name	Туре	Title	Field	Rank	Full time	Courses Faculty member will Teach
Rand Obeidat	Tenure Track	PhD	Information Systems (IS)	Assistant Professor	x	DANL 280, BUIS 305, BUIS 362, DANL 340, BUIS 462, DANL 480, DANL 490
Azene Zenebe	Tenured	PhD	Information Systems	Professor	х	BUIS 305, BUIS 362, DANL 340, BUIS 462, DANL 480, DANL 490
Elmer Tony Yorkman	Non Tenure Track	Masters	Information Systems	Lecturer	х	BUIS 362, DANL 340, BUIS 462, DANL 480
Andrea Calloway	Non Tenure Track	Masters	Information Systems	Lecturer	х	BUIS 260, DANL 280, BUIS 305, BUIS 362, DANL 340
Andrew Mangle	Tenure Track	PhD	Information Systems	Assistant Professor	х	BUIS 260, BUIS 305
New MIS Faculty Member	Tenure Track	PhD	Computer Science / IS	Assistant Professor	х	BUIS 260, DANL 280, BUIS 305, BUIS 362, DANL 340
LaTanya Brown-Robertson	Tenured	PhD	Applied Economics	Professor	х	DANL 280, DANL 340, DANL 490, ECON 400, ECON 493
Augustin Ntembe	Tenured	PhD	Applied Economics	Associate Professor	х	DANL 280, DANL 340, DANL 490, ECON 400, ECON 493, BUIS 462
Thadee Badibanga	Tenure Track	PhD	Applied Economics	Assistant Professor	х	DANL 280, DANL 340, DANL 490, ECON 400, ECON 493, BUIS 462
Shadiya Hossain	Tenure Track	PhD	Financial Economics	Assistant Professor	х	DANL 280, DANL 340, FINA 400, ECON 400, ECON 493
Regina Tawah	Tenured	PhD	Economics	Associate Professor	х	DANL 280, DANL 340, FINA 400, ECON 400, ECON 493
Sunando Sengupta	Tenured	PhD	Financial Economics	Professor	х	DANL 280, FINA 400
Tibebe Assefa	Tenured	PhD	Finance	Assistant Professor	х	DANL 280, DANL 340, FINA 400, DANL 490
Daryl B Stone	Tenured	PhD	Computer Science	Associate Professor	х	CTEC 226 - INTRO TO DB DEVELOPMENT
Thomisha M Duru-Nnebue	Tenured	PhD	Computer Science	Assistant Professor	х	CTEC 125 - INTRO TO PYTHON PROGRAMMING
Darsana P Josyula	Tenured	PhD	Computer Science	Professor	x	COSC 474 MACHINE LEARNING

Table 4 Faculty Profiles for the Data Analytics Program Courses

J. Adequacy of Library Resources (as outlined in COMAR 13B.02.03.12).

The Thurgood Marshall Library of Bowie State University supports the University's mission of teaching and learning with a collection of over 280,000 volumes (physical and electronic), over 700 academic subscription titles, an electronic portal (ResearchPort) to over 70 databases, as well as videos and DVD recordings, and experienced staff. The Library also promotes information literacy education by collaborating with the university faculty in utilizing current technology and teaching methods to enhance an instructional program that teaches library clientele how to access, evaluate, and utilize information.

As a member of the University System of Maryland and Affiliated Institutions (USMAI), Bowie State also has access to the collections of thirteen university libraries in the state of Maryland. A daily delivery between the participating libraries is provided to assist patrons in obtaining materials from other libraries in the system. Also, all registered patrons have access to interlibrary loan services, which is a resource-sharing system, for materials not available within the USMAI.

The Library's physical collection of books in the fields of philosophy, government, and economics are typical in scope and size for a university the size of Bowie State University. This collection is presently

serviceable for the instructional and research expectations upon this program's majors. To ensure that this collection is more than enough for background reading and research undertakings by students in all this program's core and elective courses, the program's faculty are making requests for acquisitions of hundreds of additional volumes, and those requests will be fulfilled during the coming academic year.

The College of Business faculty works closely with the Library Interim Director to ensure, adequate resources are available to content instruction, and research. The faculty have worked with the library to ensure resources such as Lynda.com and ScienceDirect continue to be available for faculty and students. Also, the College of Business has a license through University of Maryland College Park to access the Wharton Research Database systems for Data Analysis class projects and research. Through the Data Science and Analytics Initiative Advisory Board, corporations have provided data and real cases for faculty to utilize in their courses and through the capstone course.

K. Adequacy of Physical Facilities, Infrastructure and Instructional Equipment (as outlined in COMAR 13B.02.03.13)

Bowie State University delivers a robust technological infrastructure. The campus is home to a new \$445.500 Cray supercomputer called the Sphinx (housed in the Computer Science Building) awarded through a grant from the Department of Defense U.S. Army Research Office. The University also has several computer labs across campus with each having up to 25 workstations containing standard application software and IBM SPSS Statistics version 23 that supports statistical data analysis and some of the machine learning algorithms.

The College of Business currently resides in a state-of-the-art building equipped with six new computer labs with 25 to 35 PCs designed for flexible, active learning environments ideal for independent and collaborative work. The University also houses four additional computer labs in the Thurgood Marshall library containing 27 to 35 PCs along with one instructional lab.

All faculty (full time, part-time, adjunct) and students at BSU have access to the university's Blackboard LMS along with full-time staff of three who are available for technical issues and support.

L. Adequacy of Financial Resources with Documentation (as outlined in COMAR 13B.02.03.14)

Table 5 and Table 6 list the fiscal revenues and expenditures that demonstrate adequate resources for this concentration. The MIS Department and the Accounting Finance and Economics Department can administer most of the proposed concentration program with existing faculty members and the addition of the New Data Analytics Professor (Dr. Rand Obeidat) and the NEW MIS Instructor (to be filled in spring 2021) who have expertise in the relevant subject matter. The addition of these two new faculty members allows for ease in implementation of the concentration program. All other administrative and support services will be embedded into the Department's existing resources.

Table 5 Revenues					
Resource Categories	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1.Reallocated Funds	0	0	0	0	0
2. Tuition/Fee Revenue					
(c+g below)	93,431	144,216	193,202	249,763	304,590
a. #F.T Students	10	15	20	25	30
b. Annual Tuition/Fee Rate (18 crd/yr.)	o 117	0 10 0			
(in-state)	8,445	8,698	8,959	9,228	9,505
c. Annual Full Time					
Revenue (a x b)	84,450	130,475	179,186	230,702	285,148
d. # Part Time Students	2	3	3	4	4
e. Credit Hour Rate (tuition + fees)	374.21	381.69	389.33	397.11	405.06
f. Annual Credit Hours	12	12	12	12	12
g. Total Part Time					
Revenue (d x e x f)	8,981	13,741	14,016	19,062	19,443
3. Grants, Contracts, & Other External	0	0	0	0	0
Sources	0	U	U	U	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1 - 4)	93,431	144,216	193,202	249,763	304,590

Assumes FY 2021 as first year of program

Reallocated Funds: N/A

Annual Tuition/Fee Rate reflects FY21 approved rates

Credit Hour Rate reflects FY21 part-time undergraduate per credit hour rate and fees with a 2% increase in the subsequent years.

Grants: N/A

Other Sources: N/A

TABLE 6. EXPENDITURES					
Expenditure Categories	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1. Total Faculty Expenses					
(b + c below)	0	0	0	0	0
a. # FTE					
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
2. Total Administrative					
Staff Expenses (b + c below)	0		0	0	0
a. # FTE					
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
3. Total Contractual Adjunct/Staff	7.500	7.5.0	7.500	15 100	15 120
Expenses $(b + c below)$	/,560	/,560	/,560	15,120	15,120
a. # FTE	1	1	1	2	2
b. Total Salary	7,000	7,000	7,000	14,000	14,000
c. Total Benefits	560	560	560	1,120	1,120
4. Equipment					
5. Marketing/Advertising	1,500	1,000	1,000	1,000	1,000
6. New or Renovated Space	0	0	0	0	0
7. Other Expenses	12,000	18,000	23,000	29,000	12,000
TOTAL (Add 1 - 7)	21,060	26,560	31,560	45,120	28,120

1-Full-time Faculty: N/A

2-Admin Staff: N/A

3-Assumes one adjunct in years 1-3 and two in years 4-5. Average Salary for Adjunct Faculty at \$3,500 per course/semester plus 8% for fringe benefits 4- Equipment: N/A

5- Marketing and advertising costs to market program
6-New or Renovated Space: N/A
7-Average annual scholarship of \$1,000 per number of proposed students for the program.

M. Adequacy of Provisions for Evaluation of Program (as outlined in COMAR 13B.02.03.15).

This program's courses and faculty will be evaluated using the BSU end of course evaluation survey each semester. Course-embedded assignments and rubrics will be used to evaluate student learning outcomes (SLOs) relevant to a course following the Data Analytics student learning outcomes assessment plan.

The ongoing end-of-course evaluation survey will track data on students' satisfaction with the data analytics courses and faculty. These data will be aggregated for the data analytics concentration to assess its effectiveness. Student retention: Student enrollment number for the program will be monitored and retention rate will be calculated. Cost-effectiveness: enrollment numbers in various data analytics classes will be monitored and revenue/cost will be calculated.

Assessments of student learning outcomes: Measured through implementation of the Data Analytics Concentration student learning outcomes (SLO) assessment plan.

N. Consistency with the State's Minority Student Achievement Goals (as outlined in COMAR 13B.02.03.05).

As Maryland's first Historically Black Institution, Bowie State University is committed to providing access to high quality higher education to African-Americans and other under-represented minorities. The goals established in the University's Racing to Excellence FY 2019 - FY 2024 Strategic Plan support student achievement and long-term viability of the institution and align with the goals in the 2017-2021 State Plan for Postsecondary Education: Student Success with Less Debt. Specifically, Bowie continues to support educational opportunity for Marylanders (Success, Strategy 4), engage in a continuous improvement process to ensure that institutional policies and practices support student success (Success, Strategy 5), provide alternative modalities, new programs and pedagogies and streamlined student and academic support services to facilitate timely degree completion (Success, Strategy 6) (Innovation, Strategy 9), integrate high impact practices into the student experience, including career advising and planning into internship experiences (Success, Strategy 7), partner with business, government and other institutions to support workforce development and graduate readiness (Innovation, Strategy 8), and expand support for grant participation and research (Innovation, Strategy 10). Bowie State faculty, staff, students and administrators are engaging in change management strategies and embracing experimentation so that the holistic needs of students can be better met (Innovation, Strategy 11).

Bowie State University has a long-standing core commitment to diversity; it values and celebrates diversity in all its forms. The university community believes that its educational environment is enriched by the diversity of individuals, groups and cultures that come together in a spirit of learning. As the university aspires to even greater racial diversity, it fully embraces the global definition of diversity that acknowledges and recognizes differences and advances knowledge about race, gender, ethnicity, national origin, political persuasion, culture, sexual orientation, religion, age, and disability. The university creates positive interactions and cultural awareness among students, faculty and staff by infusing global diversity awareness in the curriculum, expanding co-curricular programming that promotes diversity awareness and maintains a campus climate that respects and values diversity.

O. Relationship to Low Productivity Programs Identified by the Commission:

This new AOC within the Bachelor of Science in Business Administration program has no relationship with a low productivity program identified by the Commission.

P. Adequacy of Distance Education Programs (as outlined in COMAR 13B.02.03.22)

Not Applicable.

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Appendix A - Elective Courses

BIOL 421 BIOINFORMATICS 4 CREDITS

Prerequisite(s): CHEM 309, BIOL 303. This course provides instruction in and practical applications of the tools and techniques employed in Bioinformatics. Included are methods for prediction of protein structure, homology modeling, sequence alignment and database searching, comparative genome analysis and structure-based drug design.

COSC 474 MACHINE LEARNING AND DISCOVERY 3 CREDITS

Prerequisite(s): COSC 214. Artificial intelligence techniques for knowledge acquisition by computers. Fundamental problems in machine learning and discovery. Systems that learn from examples, analogies, and solved problems. Systems that discover numerical laws and qualitative relationships. Projects centering on implementation and evaluation.

CTEC 324 DATABASE APPLICATION DEVELOPMENT 3 CREDITS

Prerequisite(s): CTEC 300, COSC 208. This course is an in-depth examination of the database application development process. Topics include database queries, software development life cycle, SQL, PL/SQL, PRO C, SQLJ, COBRA, and ODBC standards. Students will develop applications using these database languages.

CTEC 424 DATABASE ADMINISTRATION 3 CREDITS

Prerequisite(s): CTEC 300. This course is an in-depth examination of the tasks related to database administration. Students will design, implement, and manage their own database architecture. Emphasis will be on data distribution, security, backup/recovery, monitoring, and performance tuning.

COSC 473 ARTIFICIAL INTELLIGENCE 3 CREDITS

Prerequisite(s): COSC 214. This course is an introduction to basic concepts and techniques of artificial intelligence. Topics include: knowledge representation, search strategies, fuzzy and probabilistic reasoning, and theorem proving. Applications of AI languages and the design and construction of Expert Systems are discussed.

FINA 400 SPECIAL TOPICS IN BANKING AND FINANCE 3 CREDITS

Prerequisite(s): FINA 320. This course will involve a wide spectrum of special topics like Real Estate Finance, Insurance etc. in banking and finance with one selected for each semester in which it is offered. The topics will be chosen based on the interests of students in the Business Administration program.

ECON 493 ELEMENTS OF ECONOMETRICS 3 CREDITS

Prerequisite: ECON-211, ECON 212 and ECON 351 Introduction to Econometrics is a course that will focus on the development and application mathematical and statistical method to estimating the relationship between and testing the validity of economic theory. ECON-451 is an introductory course in Econometrics Methods. Elementary econometric models and techniques will be introduced in this course. Students are expected to acquire the skills necessary to do conduct regression analysis with real economic data. Computer programs such as SPSS, STATA, MINITAB, and Microsoft Excel will be used for running real-world problems.

Appendix B.

Data Analytics Concentration, BS in Business Administration Program Sequence Sheet

			Freshr	nman Sophomore Junior Senior		enior					
		Course Name & Number	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Sem. Hrs.
А	GENERAL EDUCATION REQUIREMENTS 45 Sem Hours										
Ι	ENGLISH 6 Sem Hrs										
3	English Composition I	ENGL 101	3								3
3	English Composition II	ENGL 102		3							3
п	ARTS and HUMANITIES 6 Sem Hrs										
3	Oral Communication or Public Speaking	SPGL 101 or 103		3							3
3	Introduction to Principles of Reasoning	РНШ 103		3							3
III	SOCIAL SCIENCES 9 Sem Hrs			5							5
3	Afro American History	HIST 114 or 115		3							3
3	Principles of Macroeconomics (prereq: Sophomore Standing)	ECON 211			3						3
3	Principles of Microeconomics (prereq: Sophomore Standing)	ECON 212				3					3
IV	SCIENCE ELECTIVES* 7-8 Sem Hrs										
	*at least 1 course with lab required										
	Life Science Elective (BIOL group)										
3-4						4					4
3-4	Physical Science Elective (PHYS, CHEM, PHSC)			3							3

			Freshr	Freshman		homore	Junior		Senior		
		Course Name & Number	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Sem. Hrs.
V	MATHEMATICS 3 Sem Hrs										
3	College Algebra	MATH 125	3								3
VI	EMERGING ISSUES 3 Sem Hrs										
3	Computer Applications in Business	BUIS 260			3						3
VII	INSTITUTIONAL REQUIREMENTS 6 Sem Hrs										
3	Freshman Seminar	FRSE 101	3								3
3	Health and Wellness HEED 102 or IDIS 210		3								3
VIII	GENERAL ELECTIVES 5-6 Sem Hrs										
3	General Elective	DANL 280*			3						3
3	General Elective								2		2
В	BUSINESS ADMIN. MAJOR REQUIREMENTS 51 Sem Hrs										
3	Introduction to Business	MGMT 101	3								3
3	Accounting I (Prereq. BUAD 100; BUAD 101)	ACCT 211			3						3
3	Accounting II (prereq. Acct 211)	ACCT 212				3					3
3	Principles of Marketing (Prereq. BUAD 101)	MKTG 231			3						3
3	Principles of Management (Prereq. BUAD 101)	MGMT 241				3					3

			Freshr	nan	Sop	homore	Junior Senior		enior		
		Course Name & Number	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Sem. Hrs.
3	Principles of Finance (Prereq. ACCT 212, ECON 211-212)	FINA 320					3				3
3	Organizational Behavior (Prereq. MGMT 241)	MGMT 344						3			3
3	Technical & Report Writing - a Dept Requirement	ENG 361					3				3
3	Business Law I (Prereq. Phil 103, Mgmt 241, and Junior Status/Instructor's permission)	BUAD 350					3				3
3	Information Systems for Management (Prereq: BUIS 260)	BUIS 360						3			3
3	Money & Banking (Prereq. ECON 211 and Jr. Status)	ECON 321					3				3
3	Business & Economic Statistics (Prereq. MATH 125, Junior Status)	ECON 351						3			3
3	Professional Development and Ethics I	MGMT 356				2					2
3	Professional Development and Ethics II	MGMT 358				1					1
3	Business Strategy & Policy (Prereq. MKTG 231, MGMT 241, FINA 320 and Senior Status)	MGMT 440								3	3
3	Production & Operations Management (Prereq. MGMT 241, ECON 351)	MGMT 480								3	3
3	Quantitative Methods for Decision Making	ECON 483							3		3
3	College of Business Elective**(300 or 400 Level Business)								3		3

			Freshman		Sophomore		Junior		Senior		
		Course Name &		а ·	T 11	с ·	E 11	а ·	F 11	с ·	C II
	DATA ANALYTICS CONCENTRATION	Number	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Sem. Hrs.
C	REQUIREMENTS 24 Sem Hrs										
3	A Programming Course (Prereq. BUIS 260)	BUIS 305 (Fall)					3				3
3	Database for Business (Prereq. BUIS 260)	BUIS 362 (Spring)						3			3
3	Visualization and Visual Analytics (Prereq. DANL 280)	DANL 340* (Spring)						3			3
3	Decision Science and Analytics (Prereq. BUIS 362)	BUIS 462**(Fall)							3		3
3	Big Data Analytics (Prereq. BUIS 462)	DANL 480*(Spring)								3	3
3	Capstone (Prereq. BUIS 462, DANL 480)	DANL 490*(Spring)								3	3
	2 Elective Courses (from approved list of relevant courses)										
3	DANL Elective 1								3		3
3	DANL Elective 2									3	3
	Total		15	15	15	16	15	15	14	15	120

* New Courses ** Revised Course