Creating a Business Intelligence and Analytics Schedule of Courses

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Abstract

Every University a process for the creation of a new program. Part of that process included defining the courses required by the program. The goals of the process described in this paper include: defining a body of knowledge for Business Intelligence and Analytics, converting that body of knowledge into a set of courses and limiting the additional faculty support need to teach the new program, by using as many existing courses as possible.

Business Intelligence and Analytics (BIA) as a discipline is made up of several related activities: data mining, online analytical processing, querying and reporting, statistical and quantitative analysis, exploratory and predictive models, and fact-based management to drive decisions and actions. These activities are found the Management Science, MIS and Statistics.

PART I: DESCRIPTION OF MAJOR

The proposed major in Business Intelligence and Analytics is a natural extension of the existing majors in the College of Business. Most of the resources needed for the major are already in place. Existing faculty have experience in this discipline. No other school in this state offers such a degree, and the development of the major would permit state residents to study Business Intelligence and Analytics without needing to leave the state and pay higher fees and tuition. Additionally, students from nearby states who desire a high paying job may decide to enroll in the major.

A. Degree Objectives

The objectives are to prepare individuals for careers in Business Intelligence and Analytics. They will:

1. Be conversant in the BIA terminology and language;
2. Understand the information systems, analytic techniques, and the development of business models they will need to drive decision-making;
3. Demonstrate critical thinking skills and independent decision making based on relevant theory and analysis of empirical facts;
4. Communicate successfully in writing and orally, at both the individual and large-group level; and

B. Program Identification

The following is the appropriate program identification as provided in the Classifications of Instructional Programs developed and published by the U.S. Department of Education Center for Educational Statistics:

CIP Codes: 52.1301, 52.1302, 52.0207, 52.1402, 52.1299
Title: Management Science, Business Statistics, Customer Service Management, Marketing Research and Management Information Systems and Services
Definition: (Note: The uniqueness of this program requires cross-referencing several general CIP Codes. If only one can be used the first, 52.1299, is best: Any instructional program in Management Information Systems and Services, Other.)

C. **Degree Features**

The major in Business Intelligence and Analytics will be the only such program in the State provided by any public or private institution. The degree will consist of 120 undergraduate credit hours designed to be completed over a four year period. The catalog description of the major will read:

Business Intelligence and Analytics Major - A minimum of 36 credit hours, to include: Yet to be selected statistics course, MIS 340, MIS 360 (new Introduction to BIA course), MGT 420, MIS 444, MIS 460 (new BIA II course), MIS 476 (new BIA project course) with a focus in ACC, ECN, FIN, MGT, MKT, or MIS. Each focus areas require 9 credit hours selected from the following couses.
MKT three of the following MKT courses: MKT 231, MKT 437, MKT 442 or MKT 440.
MIS three of the following MIS courses: MIS 300, MIS 310, MIS 412, or MIS 465
FIN three of the following finance and/or economics courses: FIN 343, FIN 425, ECN 423 or FIN 431
The focus areas in ACC, MGT and ECN will be described as faculty in these areas select 3 or more courses.
Students will take MGT 460 as a capstone

Descriptions of the new courses are provided in Appendix A.

Admission and Performance Standards

All students must meet the standard University admission requirements and those of the College of Business. All students must maintain their performance in accordance with the policies of the University and the College of Business.

Degree Requirements

Appendix B contains the Four Year Curriculum Plan Template for the BBA – Business Intelligence and Analytics degree.

D. Degree Outcomes

The following outcome measures have been established for students seeking a major in Business Intelligence and Analytics:

1. Eighty percent or more of all students admitted will successfully complete the program within five years.
2. Within six months of successful completion of the major, 90% of graduates will be employed in the field of Business Intelligence and Analytics or related areas.

E. Degree Delivery

All coursework will be offered on campus.

PART II: DEGREE NEED AND JUSTIFICATION

A. Relationship to Institutional Goals/Objectives

The addition of this major in Business Intelligence and Analytics would benefit the citizens of state and the surrounding region by providing additional educational options in the area of Business Intelligence and Analytics. The Mission Statements of both the University and the College of Business commit the institution to be a contributor to the region's overall economic development. State private and public employers seek managers with training and/or experience in big data. The major in Business Intelligence and Analytics will prepare graduates to better serve these needs.

B Existing Degrees

There are no other schools in the state that offer either a major or minor in Business Intelligence and Analytics. Students with an interest in this field must travel out of state to seek their education at greater expense. Currently, a student desiring a baccalaureate degree in Business Intelligence and Analytics will have to travel to Pennsylvania, Texas, Arkansas, Arizona or Colorado. Attending an out-of-state school would require a student to relocate and pay higher levels of tuition and fees. The addition of the major in Business Intelligence and Analytics would create a cost-effective alternative for all the state, and would be attractive to students from nearby states.

C. Degree Planning and Development

The College of Business is accredited by the AACSB and currently offers majors in Accounting, Economics, Finance, International Business, Management, Management Information Systems, Marketing, and Risk Management and

Insurance. The proposed major in Business Intelligence and Analytics complements the existing offerings and provides a new dimension to the offerings. The faculty of the College has the expertise to plan and develop the Business Intelligence and Analytics major so that it makes the best use of existing resources and courses.

D. Clientele and Need

The major in Business Intelligence and Analytics is designed to prepare students for career opportunities in business intelligence and business analytics. Business intelligence and analytics in a related field of big data analytics have become increasingly important over the past two decades.

E. Employment Opportunities

The US Bureau of Labor Statistics estimates that in 2010 in the United States there were 28,200 managers working in this area. The mean annual wages for these workers is $100,660.

An IBM tech trends report identified business analytics as one of the four major technology trends in the 2010s. A McKinsey Global Institute report predicted by 2018 the United States will face a shortage of 140,000 to 190,000 people with deep analytical skills and a shortfall of 1.5 million data savvy managers with the ability to analyze big data in making effective decisions. (Manyika, 2011)

Writing for *Business* Week, Spencer E. Ante stated, "Envangelos Simoudis, managing director of the venture capital firm Trident Capital, said that 12 of the 50 companies in his firm's portfolio are focused on the analytics market…. Simoudis believes the demand for these jobs will only grow thanks to several big trends. One is the sheer data explosion. When Simoudis was working in the software business in the 1980s, he said data warehouses use to handle two terabytes of data. Today, just one small online ad network is generating 100 terabytes of data, while social network Facebook is spewing out 1.5 petabytes of data a year, or 1,500 terabytes. All those status updates and party photos consume massive amounts of data.

The second trend is that decision making has become much more performance based. Intuition is out. Metrics are in, especially in a tough economy where every dollar counts. Lastly, there has been a democratization of data. The rise of the Web and dashboard technologies is giving more and more people the ability to access data. And they want it." (Macmillan, 2009)

F. Degree Impact

The major in Business Intelligence and Analytics will augment the existing programs in the College of Business and provide students with additional

educational choices. These courses could also be appropriate as electives for other majors outside of the College of business, such as Mathematics and Integrated Science & Technology in the College of Science and Computer Science in the College of Information Technology and Engineering. The existence of the major should attract students to Marshall University by creating a viable area of study that is not available at many institutions in the United States.

G. Cooperative Agreements

There are no cooperative agreements in place at this time.

H. Alternatives to Development of the Major

There are no alternatives to the development of this major. There are no Business Intelligence and Analytics majors offered at West Virginia colleges or at colleges in any of the contiguous states. Students wishing to pursue this field of study must leave the area at considerable personal cost. Marshall University and West Virginia should capitalize on this opportunity and exert a positive influence on the economic development and environment of the state.

PART III: DEGREE IMPLEMENTATION AND PROJECTED RESOURCE REQUIREMENTS

A. Degree Administration

Program administration will be provided by the Head of the Division of Management, Marketing and MIS in the College of Business. The Head will organize, administer, review, develop, and assure program effectiveness through on-going program assessment. The Head will also coordinate activities with other colleges offering courses. The faculty of the division will be responsible for the development and delivery of the courses.

B. Degree Projections

Initial enrollment is presently projected to grow to 20 students per class. Assuming a 10% drop rate in both the freshman and sophomore years, the total number of majors would grow to 74 students with 34 actively involved in major-specific courses at any time. This is a conservative estimate and does not include possible students from other colleges. The five year projection of enrollment is presented in Appendix C. Details of the projections are presented in Appendix D.

C. Faculty Instructional Requirements

The major in Business Intelligence and Analytics consists of one specified lower level course, six specified upper level courses, and three upper level electives. Several of these must be taught by faculty specializing in Business Intelligence and Analytics. By adjusting the way current courses are being presented this major should not require any additional faculty resources. The addition of a dedicated computer lab with dedicated servers to support the storage and analysis of large data sets will be required in the future.

D. Library Resources and Instructional Materials

Library resources currently offered at the University are sufficient. No new or additional library resources will be necessary at this time.

E. Support Service Requirements

No additional support services are required.

F. Facilities Requirements

None

G. Operating Resource Requirements

None.

H. Source of Operating Resources

Faculty, personnel, and facility resources are the responsibility of the university. Operational funds will be derived from tuition and fees.

PART IV: OFFERING EXISTING PROGRAMS AT NEW LOCATIONS

Not applicable.

PART V: DEGREE EVALUATION

A. Evaluation Procedures

Evaluation is a critical component to the success of any program. Marshall University has a systematic and on-going evaluation process. All university departments must submit an annual assessment and program evaluation through the Office of Program Review and Assessment. The College of Business also conducts a continuous review process known as Assurance of Learning (AOL). The AOL process monitors the material presented in the courses and the success of students in mastering this material. Feedback is given to each discipline concerning the success of their courses, and faculty members make the changes necessary to improve the quality of instruction.

Student feedback is sought through semester student evaluations and questionnaires given to new graduates. The evaluations each semester provide information concerning the perceptions of the students as they are in the educational process while the end-of-program questionnaire allows students to give detailed comments about the entire program and its effectiveness. These inputs from students are used to adjust the course material and the way it is presented.

B. Accreditation Status

The College of Business is accredited by the Association to Advance Collegiate Schools of Business International (AACSBI). All programs within the college are subject to continuous and rigorous review to assure that they meet the highest standards and provide quality educational opportunities for the students. The major in Business Intelligence and Analytics will dovetail with the existing degree in Management, which has already passed AACSB review. The

experience of the college, division, and faculty will ensure that the major in Business Intelligence and Analytics will meet and surpass AACSBI accreditation standards.

PART VI: TERMINATION OF A PROGRAM

All program termination procedures will be guided by Marshall University policies on program termination located in the undergraduate student handbook and Marshall University's Greenbook. Any decision to terminate this program would require that sufficient coursework be taught to complete the degree for all accepted students, or arrangements be made with another institution offering a like degree to accept all students enrolled.

PART VII: GUIDELINES FOR COOPERATIVE DOCTORAL PROGRAMS

Not applicable.

APPENDIX A

BBA – BUSINESS INTELLIGENCE AND ANALYTICS
DESCRIPTION OF COURSES

1 REQUIRED LOWER LEVEL COURSES (3 HOURS)

Statistics **3 hrs**
A yet to selected statistics course..

6 REQUIRED UPPER LEVEL COURSES (18 HOURS)

MIS 360 Introduction to Business Intelligence and Analytics 3 hrs
This is a new course under development and the course title, number designator and description have not been finalized.

MIS 340 Introduction to Database Management Systems. 3 hrs
Introduction to enterprise data administration emphasizing database environment and architecture, relational model and languages, database requirements, and modeling. Introduction to the use of a database management system.

MGT 420 Operations Management. 3 hrs
Management of operation systems including system design, implementation and control. Analysis of the system in the areas of product, process, material quality, and facilities management. Topics include breakeven analysis, inventory models, transportation models, network analysis. (PR: MGT 218, MTH 203)

MIS 444 Advanced Database Management Systems 3 hrs
Enterprise database administration; issues surrounding database implementation, security, ethics, distributed databases, and advanced language features using a database management system. (PR: MIS 340)

MIS 460 Business Intelligence and Analytics II 3 hrs
This is a new course under development and the course title, number designator and description have not been finalized.

MIS 476 Business Intelligence and Analytics Project ask 3 hrs
This is a new course under development and the course title, number designator and description have not been finalized.

3 COURSE ELECTIVES FROM ONE AREA OF CONCENTRATION (9 HOURS)

Finance and Economics Concentration - choose three of the following courses:

FIN 343 Intermediate Financial Management 3 hrs

Application of financial principles to corporate business problems. Computer analysis will be utilized where appropriate. (PR: FIN 323)

FIN 425 Portfolio Analysis and Management. 3 hrs.
Analytical procedures for valuing various financial securities and techniques for the creation and maintenance of portfolios. (PR: FIN 370)

ECN 423 Introduction to Econometrics. 3 hrs..
Combines economic theory with real data to obtain quantitative results for purposes of explanation and prediction. The development of useful economic models applicable to present day world problems. (PR: ECN 250, ECN 253, MGT 218, MTH 203)

FIN 431 Futures and Options 3 hrs
This is a new course under development and the course title, number designator and description have not been finalized.

MIS Concentration - choose three of the following courses:

MIS 300 Introduction to Business Programming. 3 hrs.
Introduction to programming in a business context, emphasizing problem solving using basic programming logic and data structures, interface concepts, file and database access, and selection and use of development tools. (PR: MIS 290)

MIS 310 Business System Analysis and Design. 3 hrs.
The course covers business application systems development, behavioral considerations in the development process, feasibility assessment, requirement analysis, and communication skills. Emphasis on prototyping and fourth generation languages.

MIS 412 Enterprise Systems. 3 hrs.
A study of cross-functional and process-oriented information systems. Topics to include business process management, supply-chain, and relationship management systesm. (PR: MIS 290 or permission of COB advising office)

MIS 465 Business Decision Support Systems. 3 hrs.
A study of decision support systems (DSS) in terms of building and providing end-user support for managerial decision making. Advanced topics will include computer interface design and artificial intelligence.

Marketing Concentration - choose three of the following courses:

MKT 231 Principles of Selling. 3 hrs.
Elements of professional personal selling from prospecting through follow-up designed for individuals preparing for a career in sales/marketing and those desiring skills to influence, persuade, or lead others.

MKT 437 Consumer Behavior. 3 hrs.

Acquaints the student with individual and group behavior as it pertains to consumer activity. Theories and findings in the behavioral sciences, as well as those set forth by marketing scholars, are examined so as to understand the behavioral patterns of consumers. Cultural, social, and psychological influences are considered, in addition to the traditional economic interpretations. The stress of the course is on incorporating these data into the managing of the marketing effort.

MKT 440 Sales Management. 3 hrs.
An exploration of the duties and activities of sales managers. Topics typically include planning and forecasting as well as organizing, staffing, training, compensating, motivating, and evaluating the sales force. (PR: MKT 340)

MKT 442 Market Research. 3 hrs.
Scope and importance of market and distribution research; product, package, brand analysis and social impact; consumer, industrial and institutional survey, quantitative and qualitative analysis of market data; situation analysis, sampling, tabulation and presentation methods. (PR: MKT 340, MGT

APPENDIX B

BBA – BUSINESS INTELLIGENCE AND ANALYTICS (BIA)
FOUR YEAR CURRICULUM PLAN TEMPLATE

Year One			
Fall Semester		**Spring Semester**	
MIS200 Business Computer Applications	3 hours	ECN250 Principles of Microeconomics	3 hours
Composition: ENG101 Composition (or equivalent)	3 hours	Communication: CMM207 Bus & Prof Communication	3 hours
FYS100: FYS100 First Year Seminar	3 hours	CT Designated Course	3 hours
		GEO101 Physical Geography	4 hours
Social Science: PSY 201 Introduction to Psychology	3 hours	Humanities:	3 hours
Mathematics: MTH130 (3 hrs) or MTH127 (5 hrs)	3-5 hours		
Hours:	**15-17 hours**	**Hours:**	**16 hours**
Year Two			
Fall Semester		**Spring Semester**	
ACC215 Principles of Accounting	3 hours	ACC216 Principles of Accounting	3 hours
ECN253 Principles of Macroeconomics	3 hours	ENG204 Writing for the Workplace	3 hours
Composition: ENG201 (or equivalent, "C" or better)	3 hours	LE207 Legal Environment of Business	3 hours
		MGT218 Management Statistics	3 hours
Physical or Natural Science GLY 200/210L Physical Geology and Lab	4 hours	CT Designated Course	3 hours
CMM Studies Elective	3 hours		
Hours:	**16 hours**	**Hours:**	**15 hours**
Year Three			
Fall Semester		**Spring Semester**	
MGT 219 Business Stats II	3 hours	FIN323 Principles of Finance	3 hours
MGT320 Principles of Management	3 hours	MIS 340 Database Systems	3 hours
		MIS 360 Introduction to BIA	3 hours
MIS290 Principles Management Information Systems	3 hours	BIA Elective	3 hours
		Fine Arts	3 hours
MKT340 Principles of Marketing	3 hours		
LE308 Commercial Law	3 hours		
Hours:	**15 hours**	**Hours:**	**15 hours**
Year Four			
Fall Semester		**Spring Semester**	
MIS 444 Advanced Database Mgt Sys	3 hours	MIS 476 BIA Project	3 hour
LCOB International elective	3 hours	Writing Intensive : MGT460	3 hours
BIA Elective	3 hours	Strategic Management	3 hours
MIS 460 BIA II	3 hours	BIA Elective	3 hours
MGT420 Operations Management	3 hours	Free electives	4-6 hours
Hours:	**15 hours**	**Hours:**	**11-13 hours**
Other Requirements: Minimum Number of Hours to Graduate: 120 Minimum GPA to Graduate: 2.0 Marshall, College, Major Other: The total number of free electives depends on the number of hours the student completes in mathematics and if the student double-counts any requirements.			

APPENDIX C

BBA – BUSINESS INTELLIGENCE AND ANALYTICS
FIVE-YEAR PROJECTION OF ENROLLMENT

	First Year (2014)	Second Year (2015)	Third Year (2016)	Fourth Year (2017)	Fifth Year (2018)
Number of Students Served through Course Offerings of the Program:					
Headcount	40	40	48	61	66
FTE	40	40	64	95	105
Number of Student Credit Hours Generated by Courses within the Program (entire academic year):	120	120	192	285	315
Number of Majors:					
Headcount	10	24	37	55	64
FTE majors	10	24	37	55	64
Number of Student Credit Hours Generated by Majors in the Program (entire academic year):	300	720	1,110	1,650	1,920
Number of Degrees to be Granted (annual total):	0	0	0	8	13

APPENDIX D

BBA – BUSINESS INTELLIGENCE AND ANALYTICS
FIVE-YEAR PROJECTION OF PROGRAM SIZE CALCULATIONS

	2014	**2015**	**2016**	**2017**	**2018**
Headcount of BIA Majors					
Freshman	10	15	15	20	20
Sophomore		9	14	14	18
Junior			8	13	13
Senior				8	13
BIA majors in BIA Upper Level Courses					
Junior			8	13	13
Senior				8	13
BIA credit hours from BIA juniors			9	9	9
BIA credit hours from BIA seniors			6	6	6
Total			72	165	195
Total BIA hours (annual)	120	120	192	285	315
FTE (3 credit hours/course)	40	40	64	95	105
Headcount in BIA courses	40	40	48	61	66
BIA majors	10	24	37	55	64
Credit hour per academic year	30	30	30	30	30
Total BIA major credit hours	300	720	1,110	1,650	1,920
Annualized FTE	10	24	37	55	64

APPENDIX E

BBA – BUSINESS INTELLIGENCE AND ANALYTICS
FIVE-YEAR PROJECTION OF OPERATING RESOURCE REQUIREMENTS

	First Year (2014)	**Second Year (2015)**	**Third Year (2016)**	**Fourth Year (2017)**	**Fifth Year (2018)**
A. FTE POSITIONS					
1. Administrators	0	0	0	0	0
2. Full-time Faculty	0	0	0	0	0
3. Adjunct Faculty	0	0	0	0	0
4. Graduate Assistants	0	0	0	0	0
5. Other Personnel:					
a. Clerical Workers	0	0	0	0	0
b. Professionals	0	0	0	0	0

Note: Include percentage of time of current personnel

B. OPERATING COSTS (Appropriated Funds Only)

1. Personal Services:					
a. Administrators	0	0	0	0	0
b. Full-time Faculty	0	0	0	0	0
c. Adjunct Faculty	0	0	0	0	0
d. Graduate Assistants	0	0	0	0	0
e. Non-Academic Personnel:					
Clerical Workers	0	0	0	0	0
Professionals	0	0	0	0	0
Total Salaries	0	0	0	0	0

APPENDIX E(cont)

BBA – BUSINESS INTELLIGENCE AND ANALYTICS
FIVE-YEAR PROJECTION OF TOTAL OPERATING RESOURCES REQUIREMENTS*

	First Year (2014)	**Second Year (2015)**	**Third Year (2016)**	**Fourth Year (2017)**	**Fifth Year (2018)**
2. Current Expenses	___	___	___	___	___
3. Repairs & Alterations	___	___	___	___	___
4. Equipment:					
Educational Equip.	___	___	___	___	___
Library Books	___	___	___	___	___
5. Nonrecurring Expense Office furniture and computers.	___	___	___	___	___
Total Costs	0	0	0	0	0

C. SOURCES

1. General Fund Appropriations (Appropriated Funds Only)	___	___	___	___	___
____ Reallocation	____ New funds		(Check one)		
2. Federal Government (Non-appropriated Funds Only)	___	___	___	___	___
3. Private and Other (specify)	___	___	___	___	___
Total All Sources	___	___	___	___	___

NOTE: Total costs should be equal to total sources of funding
*Explain Your Method for Predicting the Numbers (Use additional sheet if necessary)