

## FACULTY AGENDA ITEM

Date: *January 27, 2020*

Submitted by: *Tom Hickman, x1308*

SUBJECT: *School of Business - Concentration in Data Analytics*

### Description:

This major area of concentration will build on the BU 248 Foundations of Data Analysis course that was approved as a business elective in spring 2019 and then as part of the business core for all business students in fall 2019. The Data Analytics Major Area of Concentration will consist of four-courses:

DA 348 Data Discovery and Management

DA 358 Data Methods and Warehousing

DA 368 Data Mining and Modeling

DA 478 Data Analytics Applied in Practice

### Rationale:

Business Demand is high, there is a very limited supply of graduates in this major and salaries offered are at the high end of business salaries. The contemporary business world is inundated with an exponentially growing volume, variety and velocity of data that differs greatly from traditional forms of financial business data. The majority of available data is real-time streams, semi-structured or unstructured, and requires new skills and technologies to collect, assess, transform and store in cloud computing data repositories. To solve business problems, data need to be related, analyzed and reported in an insightful, visual manner. In its more mature form, assessment of real time data streams is first assessed using statistical and modeling methods, which often can mature into robotic process automation (RPA), which supports lower cost, and more effective business operations through predictive and prescriptive data analysis.

In the immediate local Topeka business area, the SOBU Dean and the VPAA in discussion with the business community have business leaders indicating a need for people with data analytics skills. Additionally, competing business schools in the immediate area (KU, K-State, Wichita State, UMKC, and Rockhurst) have developed data analytics programs. Adding the program will allow Washburn to remain competitive and provide graduates with the skill sets needed to be competitive in the market.

Financial Implications: *New Faculty will be required – See Pro forma*

Proposed Effective Date: *Fall 2020*

Request for Action: *Approval by AAC/.FAC/FS/ Gen Fac, etc*

The proposal was approved by the School of Business faculty on November 19, 2019

**Academic Affairs was interested in clarification on the following questions. Answers are provided as follows:**

1. Is this an offer only to Business School students, or to address multiple audiences and needs? List those in order explicitly.

It is a new major within the School of Business. So, it is first thought of as an offer to business school students. Even so, students from other schools or the college are eligible to take the data analytics sequence with additional prerequisites:

1. CM 105 (prerequisite: MA112 or MA116) or CM 111 (prerequisite: one of the following: MA116, MA117, MA123, MA140, MA141, or MA151)
2. EC 211 (prerequisites: MA140 and one of the following: MA116, MA141, or MA151)
3. BU 248 (prerequisites: EN101 and one of the following: MA112 or MA116)
4. BU 250 (prerequisites: EN101 and one of the following: MA112, MA116, MA140, MA141, or MA151)

NOTE: The fewest number of courses to take to complete the prerequisites to the four listed prerequisites (CM105/CM116, EC211, BU248, BU250) are to take the following three courses:

1. EN101
2. MA116
3. MA140

The completion of the data analytics sequence would not qualify as a degree since completing that sequence alone would not fulfill the entire set of requirements for a BBA.

2. Regarding goals of the concentration – does it focus beyond current on Business students only? Namely, is there a DA certificate offer for returning students (professionals)?

The current proposal is not for a certificate, it is just for the added major within the School of Business. If the major is approved, a separate proposal will be required for a possible certificate. A certificate proposal will be forthcoming in the near future. It will originate in the SOBU and will need to be approved by SOBU faculty.

3. What is required for pre-requisites for outside the Business School? Does it fit into a business minor? If yes, provide details.

See the list of prerequisites above.

It does fit into the requirements for a Business Minor. The minor is a total of 21 hours. 12 of the hours are prescriptive and 9 hours are electives. So, three of the data analytics courses (9 hours) could be used for the minor.

Approved by: AAC on date 1/27/2020

*FAC on date*

*Faculty Senate on date*

Attachments Yes x No

Curriculum Committee  
General Request Submission Form

This form requires information to be provided in two sections: (A) Now, i.e., the current status of the situation, and (B) In the Future, i.e., the change requested and how it will improve the situation in the future.

**Change request submitted by** SOBU Data Analytics Committee, Gail Hoover King, Chair.

(A) **NOW:**

**1. What is the Current Situation which needs to be addressed?**

(Describe in sufficient detail)

- a. Business Demand is high, there is a very limited supply of graduates in this major and salaries offered are at the high end of business salaries. The contemporary business world is inundated with an exponentially growing volume, variety and velocity of data that differs greatly from traditional forms of financial business data. The majority of available data is real-time streams, semi-structured or unstructured, and requires new skills and technologies to collect, assess, transform and store in cloud computing data repositories. To solve business problems, data need to be related, analyzed and reported in an insightful, visual manner. In its more mature form, assessment of real time data streams is first assessed using statistical and modeling methods, which often can mature into robotic process automation (RPA), which supports lower cost, and more effective business operations through predictive and prescriptive data analysis.
- b. In the immediate local Topeka business area, the SOBU Dean and the VPAA in discussion with the business community have business leaders indicating a need for people with data analytics skills. Additionally, competing business schools in the immediate area (KU, K-State, Wichita State, UMKC, and Rockhurst) have developed data analytics programs. Adding the program will allow Washburn to remain competitive and provide graduates with the skill sets needed to be competitive in the market.
- c. There is a weakness in the skill set for all fields in business. Current business students have not had the opportunity to acquire skills in working with data analytics.
- d. Faculty in other areas (sociology, history, art, anthropology and honors program) are interested in providing data analytics skills to their students. This is an efficient way to provide a service across campus by using existing resources of the School of Business, the qualified faculty in the area.
- e. In addition, the major will assist the School of Business to meet the AACSB Accreditation Standard 9: General Business Knowledge Areas and the soon to be released version of AACSB standards both require an increased need to add data

analysis in the business curriculum.

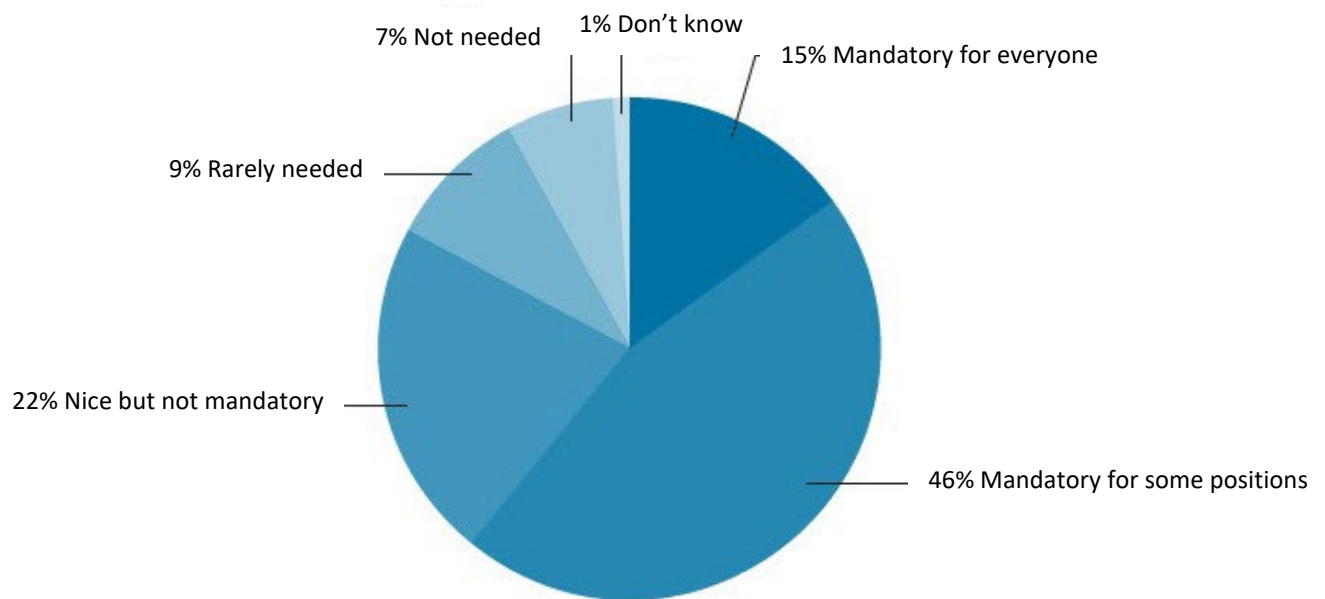
Current Standard 9

- *Evidence-based decision making that integrates current and emerging business statistical techniques, data management, data analytics and information technology in the curriculum. Student experiences integrate real-world business strategies, privacy and security concerns, ethical issues, data management, data analytics, technology driven changes in the work environment, and the complexities of decision making.*
  
- f. All areas of business have massive amounts of data (big data). Contemporary businesses are using data analytics to determine strategy, evaluate issues and markets, and develop business models. This is evidenced by multiple recent articles a few of which are listed below.
  
- Across all areas of study: The 2019 Gartner Report on “10 Ways CDOs Can Succeed in Forging a Data-Driven Organization,” identified “culture and data literacy are the top two roadblocks for data and analytics leaders.” Data literacy skills are being able to collect, manage, evaluate, and apply data, in a critical manner. The report goes on to state that by 2022, “90% of corporate strategies will explicitly mention information as a critical enterprise asset, and analytics as an essential competency... By 2023, data literacy will become an explicit and necessary driver of business value, demonstrated by its formal inclusion in over 80% of data and analytics strategies and change management programs.”
  
- *Meanwhile, mastery of data analytics can help businesses generate a higher profit margin and gain a meaningful competitive advantage. Some experts even predict that companies ignoring data analytics may be forced out of business in the long run.* (<https://www.journalofaccountancy.com/issues/2016/aug/data-analytics-skills.html>)
  
- *Globally, individuals in all areas of business can benefit from have data analytics skills. Top jobs in 2020 – Data Mining and Analysis* (<http://www.careerprofiles.info/jobs-of-2020.html>)
  
- *Data Analytics* (<https://www.edureka.co/blog/10-reasons-why-big-data-analytics-is-the-best-career-move>)
  
- *Accounting Skills You Need to Succeed On the Job* (<https://www.roberthalf.com/blog/salaries-and-skills/the-accounting-job-skills-you-need-to-succeed>) Article identified: Expertise in big data analysis, advanced modeling techniques and SQL; Knowledge of business intelligence software; and Analytical Skills.

- “The next frontier in data analytics.” *Journal of Accountancy*, August 1, 2016. The article presented results of a Robert Half survey, “How important are business analytics skills, such as business intelligence, for your accounting and finance employees?” (See Figure 1). The article presented “skills for a data-driven practice.” A practitioner interviewed stated, producing analytics starts with understanding the business objective (“What are the key questions that you expect the analysis to answer?”) and identifying and obtaining relevant data sources to support the analysis. He explained that producing analytics often occurs at the junior level and explained that the ideal “analytically skilled” employee has these three characteristics:
  - Good technical skills: Understands the data and knows how to manipulate it.
  - Understanding of the business context: Can distill a business problem or opportunity into key questions to be answered and understands the business data flow and the relationship between objects within the business context.
  - Analytical mindset: Possesses an inquiring nature and intellectual curiosity.

FIGURE 1: Survey Results

How important are business analytics skills, such as business intelligence, for your accounting and finance employees?



Analytics Skills Are Critical (<https://blog.hubspot.com/agency/importance-data-analytics-skills-marketing-hires>)

2. **How long has this situation existed in its current form?** Approximately 4 years ago,

universities started adding data analytics programs. Whether this was in response to market demands or AACSB standards is not known, but it seems the two are related and resulted in a need for action.

**3. Why is it necessary that it be changed?**

For students to be work force ready in data analytics and analysis skills as demanded in multiple areas of business.

**(B) IN THE FUTURE:**

**1. Proposed change. (Describe in sufficient detail)**

This major area of concentration will build on the BU 248 Foundations of Data Analysis course that was approved as a business elective spring 2019. The Data Analytics Major Area of Concentration will consist of four-courses:

DA 348 Data Discovery and Management

DA 358 Data Methods and Warehousing

DA 368 Data Mining and Modeling

DA 478 Data Analytics Applied in Practice

**2. How does the proposed change solve the problem?**

The Data Analytics major area of concentration will provide students with the skill sets necessary to begin a career in data analytics. The program was developed based on an understanding of the need for data analysis skills as discussed in (A)(1) above. The proposed program is based on the skills identified as relevant to business and incorporates the elements of the data processing (Figure 2) and the data literacy (Table 1).

**3. What new problem(s) might this proposed change create?**

Requiring resources: IT personal, faculty, and software.

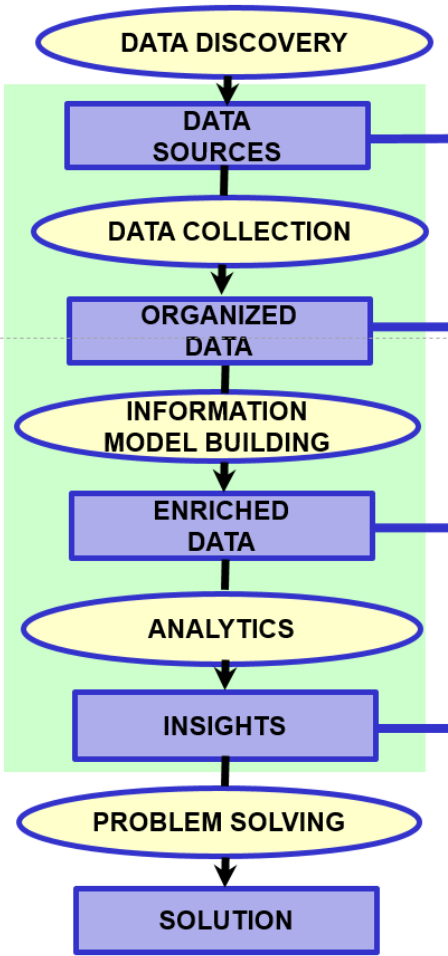
**4. What objection(s) to the proposed change are likely to arise?**

- Cost of resources
- Ability to schedule so any student major in business can double major
- Insuring the nonbusiness school prerequisites meet the need of the program
- Limiting to nonbusiness majors and alumni and practitioners who may not have the prerequisite courses or will need additional prerequisite requirements

**5. Are there any decision deadlines which the Committee needs to be aware of?**

- As many competing universities in the geographic area are already offering a data analytics programs, not offering the major or waiting could mean a loss of potential students aware of the demand for data analytics skills.

**FIGURE 2: The Data Process Chain**



Source: Geerts (2017)



**TABLE 1: Data Literacy Model**

Conceptual Framework		Data Collection				Data Management						
Introduction to Data		Data Discovery and Collection	Evaluatin and Ensuring Quality of Data Sources			Data Organization	Data Manipulation	Data Conversion (from format to format)	Metadata Creation and Use	Data Curation, Security, and Re-Use	Data Preservation	
Data Evaluation						Data Application						
Data Tools	Basic Data Analysis	Data Interpretation (Understanding Data)	Identifying Problems Using Data	Data Visualization	Presenting Data (Verbally)	Data Driven Decisions Making (DDDM) (Making decisions based on data)	Critical Thinking	Data Culture	Data Ethics	Data Citation	Data Sharing	Evaluating Decisions Based on Data

**Source:** *Strategies and Best Practices for Data Literacy Education: Knowledge Synthesis Report* (Dalhousie University, 2015)

Program Name		Data Analytics Major Area of Concentration										PRO FORMA											
CIP Code (Academic Programs)		52.1301 MIS																					
Revenue:	Estimates	Year 0 - Prepa	Year 1		FY 2020		Year 2		FY 2021		Year 3		FY 2022		Year 4		FY 2023		Year 5		Fy 2024		
<u>Est. Students/Cr Hrs Lower Division</u>			# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs			
Est. Students BU 248			100	3	197	3	237	3	237	3	237	3	237	3	237	3	237	3	237	3			
Total Credit Hours*			300		591		711		711		711		711		711		711		711				
Tuition Rate Lower Division	\$300.00		\$ 300		\$ 300		\$ 300		\$ 300		\$ 300		\$ 300		\$ 300		\$ 300		\$ 300				
<b>Total Revenue Lower Division</b>			<b>\$ 90,000</b>		<b>\$ 177,300</b>		<b>\$ 213,300</b>		<b>\$ 213,300</b>		<b>\$ 213,300</b>		<b>\$ 213,300</b>		<b>\$ 213,300</b>		<b>\$ 213,300</b>		<b>\$ 213,300</b>				
<u>Est. Students/Cr Hrs Upper Division</u>			# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs	# Students	# Cr Hrs			
Total Credit Hours*			60		270		480		585		585		585		585		585		585				
Tuition Rate Upper Division	\$386.00		\$ 386		\$386		\$386		\$386		\$386		\$386		\$386		\$386		\$386				
<b>Total Revenue Upper Division</b>			<b>\$ 23,160</b>		<b>\$ 104,220</b>		<b>\$ 185,280</b>		<b>\$ 225,810</b>		<b>\$ 225,810</b>		<b>\$ 225,810</b>		<b>\$ 225,810</b>		<b>\$ 225,810</b>		<b>\$ 225,810</b>				
Other Revenue Sources			0		0		0		0		0		0		0		0		0				
<b>Total DA Program Revenue</b>			<b>\$ 113,160</b>		<b>\$ 281,520</b>		<b>\$ 398,580</b>		<b>\$ 439,110</b>		<b>\$ 439,110</b>		<b>\$ 439,110</b>		<b>\$ 439,110</b>		<b>\$ 439,110</b>		<b>\$ 439,110</b>				
<b>Ongoing Expenses:</b>			FTE		FTE		FTE		FTE		FTE		FTE		FTE		FTE		FTE				
1 st Faculty Member	\$140,000		\$ -		\$ 140,000	1	\$ 140,000	1	\$ 140,000	1	\$ 140,000	1	\$ 140,000	1	\$ 140,000	1	\$ 140,000	1	\$ 140,000	1			
Benefits (25%)	25%		-		35,000		35,000		35,000		35,000		35,000		35,000		35,000		35,000				
IT Support per hr	\$20		10,000		10,000		10,000		10,000		10,000		10,000		10,000		10,000		10,000				
Benefits (25%)	25%		-		2,500		2,500		2,500		2,500		2,500		2,500		2,500		2,500				
Adjunct Faculty/course (\$3000 + 9% benefits)	\$3,270		4,905	1/4																			
Student stipends per hour	\$8.00		-																				
Marketing	\$ 5,000		5,000		5,000		2,500		1,000		5,000		5,000		5,000		5,000		5,000				
Travel	\$3,000		3,000		3,000		3,000		3,000		3,000		3,000		3,000		3,000		3,000				
Professional Development	\$1,500		1,500		1,500		1,500		1,500		1,500		1,500		1,500		1,500		1,500				
Accreditation/Membership	\$500		500		500		500		500		500		500		500		500		500				
Support Materials*																							
Equipment Software/Technology (option 1 AWS)			34,268		81,959		113,371		123,366		123,366		123,366		123,366		123,366		123,366				
<b>Total Expenses</b>			<b>\$ 5,000</b>		<b>\$ 59,173</b>		<b>\$ 279,459</b>		<b>\$ 308,371</b>		<b>\$ 316,866</b>		<b>\$ 316,866</b>		<b>\$ 316,866</b>		<b>\$ 316,866</b>		<b>\$ 316,866</b>				
<b>Total Net Revenue</b>			<b>\$ (5,000)</b>		<b>\$ 53,987</b>		<b>\$ 2,061</b>		<b>\$ 90,209</b>		<b>\$ 122,244</b>		<b>\$ 122,244</b>		<b>\$ 122,244</b>		<b>\$ 122,244</b>		<b>\$ 122,244</b>				
<b>One-time Startup Costs</b>																							
Furniture																							
Office Equipment																							
Computer/Software (See Equipment, Storage, & IT Support)																							
Renovation																							
Program Equipment																							
Initial Accreditation Costs																							
Total One-Time Startup Cost																							
<b>PRO FORMA</b>																							
<b>NOTES:</b>																							

\* Currently: Software being used is already licensed or is free. Additional software needs being considered are open source or provided free

## New Course Approval Routing Form

**Course Number:** DA 478

**Course Title:** Data Analytics Applied in Practice

**Course Originator:** Pamela J. Schmidt

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

Name (print)	Recommendation	Signature	Date
Faculty	Approved/Not Approved		
<u>Dr. Gail Hoover King</u>	_____.	_____.	_____.
<u>Dr. Pamela Schmidt</u>	_____.	_____.	_____.
<u>Dr. Bob Boncella</u>	_____.	_____.	_____.
<u>Dr. Rosemary Walker</u>	_____.	_____.	_____.
<u>Dr. Akhadian Harnowo</u>	_____.	_____.	_____.
_____.	_____.	_____.	_____.
Curriculum Committee Chair			
<u>Dr. Tom Hickman</u>	_____.	_____.	_____.
Faculty Chair			
_____.	_____.	_____.	_____.
Dean			
<u>Dr. David Sollars</u>	_____.	_____.	_____.
Other (as necessary)			
_____.	_____.	_____.	_____.

## New Course Proposal Form

**Course Originator:** Pamela J. Schmidt

**Department (Area):** School of Business

### 1. Proposed Catalog Description

- a. **Course number:** DA 478
- b. **Title:** Data Analytics Applied in Practice
- c. **Credits:** 3
- d. **Prerequisites:** DA 358 (Data Methods and Warehousing) and DA 368 (Data Mining and Modeling)
- e. **Description:** Students will apply the data analytics process including data discovery, transformation, organization and modeling to a real-world project and effectively communicate the solutions.

## 2. Resources (Provided by Administration with Faculty Consultation)

- a. **How often offered?** At least one semester per academic year – most likely Spring semester
- b. **Costs implications (faculty/staffing requirements - full/part-time, etc.):** 1/6 course load for faculty teaching, Data Analytics software and data sources
- c. **Academic qualifications required to teach this course:** Degree in the area of data analysis or data science, Information Systems or Computer Science, with skills in statistical analysis. Preference given to instructors with business experience, management of, or participation in, consulting engagements or large development projects, data management and/or data modeling.
- d. **Current faculty that are qualified to teach the course:** Dr. Pam Schmidt
- e. **Anticipated enrollment:** 20 students
- f. **Impact on enrollment in other classes:** As this is a capstone course, any impact on other classes would most likely have been seen earlier, as impacted by the prerequisite courses in the data analytics major.
- g. **How might the course be expected to increase enrollment?** Strong demand in the work force for data analytics talent could a) attract some business professionals seeking to expand their skills in data analysis to seek higher paid career opportunities; b) attract new undergraduate students interested in working in jobs in data analytics and related areas; and c) attract savvy undergraduate students (possibly from computer science, technology administration or business) with interest in technology that is not currently met by SOBU offerings.
- h. **If enrollment will not increase where will these students come from?** This major could attract students in the School of Business, attract a few students from outside the school as a secondary area of emphasis and/or a dual major with any other major in the School of Business.
- i. **Signature from Dean's Office** \_\_\_\_\_

### 3. Pedagogy

- a. Academic justification for this course:** Business organizations are under pressures to adapt and respond very quickly to constantly changing environment. Accordingly, they have to make frequent operational, tactical, as well as strategic decisions that will determine their future and fate. Such decisions require considerable amount of data, information, and knowledge.
- b. Learning objectives:**
1. Explain Data Governance policies and resulting operational activities related to data.
  2. Explain the current regulatory and ethical environments for data management.
  3. Prepare a proposal to solve a business problem.
  4. Develop an evidence-based solution business problem.
  5. Effectively communicate an evidenced-based solution to a business problem.
- c. How will the objectives match the School of Business objectives?** This course as part of the Data Analytics area of concentration supports AACSB expectations to provide business majors with data analysis skills and technology agility as required for AACSB Standard 9.
- d. Evaluation instruments (exams, papers, case analyses, projects, presentations, etc.):**
- Evaluations
    - Checkpoints
    - Quizzes and Exams
    - Feedback/assessment from client
    - Final project insights and recommendation presentation
- e. Grading standards:**
- |   |            |
|---|------------|
| A | 90% - 100% |
| B | 80% - 90%  |
| C | 70% - 80%  |
| D | 60% - 70%  |
| F | below 60%  |

#### 4. Resources

- a. **Added course:** Yes
- b. **If No, what course is this replacing:** N/A
- c. **Type of Course:** Required
- d. **Has the proposed course been offered as a special topics course?** No
- e. **Has the proposing faculty member(s) reviewed the catalogue and determined that the proposed course does not duplicate in title and/or content existing courses?** Yes
- f. **Reason for this course:** To provide a capstone experience in the Data Analysis major area of concentration where the students perform the end-to-end data analysis process, develop and use the range of knowledge and tools covered in the major area of study and engage in a professional consulting project with a business client and are exposed to real-world company data in a business setting.
- g. **What program does it serve?** Data Analytics Major Area of Concentration
- h. **Textbook:** Data Analysis such as: Jablonski and Guagliardo, *Data Analysis Plans: A Blueprint for Success [Using SAS: How to Plan Your First Analytics Project]* and Case Packet including Harvard Business Review's *The Creative Consulting Company*, HBR Business Consulting Projects [approx. title]
- i. **Library holdings:** Not necessary – due to the nature of the content of the course, vetted online information is sufficient.
- j. **Facilities:** Computer lab workspace with space for 2 students per workstation and desks in groupings for teams. A possibility of one (up to 5) workstations with 10 Terabyte data storage per workstation, or a 100 Gigabit network connection and cloud computing SaaS contract to support data storage and computing needs of Big Data Analysis to be done for class consulting projects. Also, online access or access in lab to tools provided by Washburn including SAP suite of data analysis tools, ARC-GIS for geographic location analysis, SAS and SPSS statistical applications, Microsoft Office Professional Suite (MS PowerBI, MS Project), text analysis software, network Graph analysis software [such as UCINET, Pathfinder,] and other tools as needed for specific project [seek client funding for added tools or purchase of external data sets for a specific client's project].

**Data Analytics Applied in Practice**  
BU 478 SAMPLE SYLLABUS  
Day and Time  
Room

**Instructor:** Dr.  
**Email:** @washburn.edu  
**Office:** Henderson Learning Center  
**Phone:** 785-670-

**Office Hours:**  
by appointment

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**Course description**

Students will apply the data analytics process including data discovery, transformation, organization and modeling to a real-world project and effectively communicate the solutions.

**Prerequisites:** DA 358 (Data Methods and Warehousing) and DA 368 (Data Mining and Modeling)

**Course objectives**

By the end of semester, students are expected to be able to:

1. Explain Data Governance policies and resulting operational activities related to data.
2. Explain the current regulatory and ethical environment for data management.
3. Prepare a proposal to solve a business problem.
4. Develop an evidence-based solution business problem.
5. Effectively communicate an evidenced-based solution to a business problem.

**Readings and Materials**

Reading, online and hands-on assignment materials will either be assigned or made available to the class as the semester progresses.

**Textbooks**

Data Analysis such as: Jablonski and Guagliardo, *Data Analysis Plans: A Blueprint for Success [Using SAS: How to Plan Your First Analytics Project]* and Case Packet including Harvard Business Review's *The Creative Consulting Company*, HBR Business Consulting Projects [approx. title]

**Course Structure**

The course activities will consist of lectures and hands-on technology lab. The assessment of learning will be based on: quizzes, hands-on technology and homework assignments, and a project that demonstrates the use of analytics to address problems.

**Course Evaluations**



Checkpoints/quizzes

Final project insights and recommendation presentation

Feedback/assessment from client

<b>DA 478 DRAFT TENTATIVE SCHEDULE*</b>	
<b>WEEK</b>	<b>TOPICS/DETAILS</b>
<b>1</b>	Managing and performing on consulting projects Intro and Prerequisite knowledge: Data Analysis exercise Data Governance and Data management
	Data Governance, Data Privacy and Security Current Legal, Regulatory and ethical environment
<b>2</b>	Potential Client company presentations: problem statements, data sets and support provided
	Discussion of Client projects, outline possible options
<b>3</b>	“Data Process Chain” Review of Data Analysis Process with students presenting one stage in some depth with an example (from prior course or outside source)
	“Data Process Chain” Data Discovery exercise
<b>4</b>	Critical Thinking
	Logic & problem-solving exercise
<b>5</b>	<b>Checkpoint 1:</b>
	The Data Process Chain PowerBI Workspace
<b>6</b>	New tool selection proposal, training materials available and team’s plan for self-education
	Data Sets and structure
<b>7</b>	<b>Checkpoint 2:</b> Problem statements, issue priorities and approaches
	Data Sources: Collection – ethical issues with data collection, PII, and data security
<b>8</b>	Data Sources – exploration, selection, presentation and review
	<b>Checkpoint 3:</b> Data sources gathered, ETL

WEEK	TOPICS/DETAILS
9	Group work
10	<b>Checkpoint 4:</b> Data Analysis – Descriptive and Diagnostic analysis
11	<b>Checkpoint 5:</b> Data Analysis – Predictive or Prescriptive
12	Visualization: Dashboards; Building reports formatting
	Story Telling: Communicating information to stakeholders
13	<b>Checkpoint 6-A: Data Analysis Draft</b> Presentation and Reports
14	<b>Checkpoint 6-A: Data Analysis</b> Presentation and Reports
15	Group Project presentations to clients Group Project feedback and debrief
16	<b>Presentations</b>

\*Tentative and subject to change.

## New Course Approval Routing Form

Course Number: **DA 358**

Course Title: *Data Methods and Warehousing*

Course Originator: **Pamela Schmidt**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name (print)	Recommendation	Signature	Date
Faculty	Approved/Not Approved		
<u>Dr. Gail Hoover King</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Pamela Schmidt</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Bob Boncella</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Rosemary Walker</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Akhadian Harnowo</u> .	. _____ .	. _____ .	. _____ .
_____ .	. _____ .	. _____ .	. _____ .
Curriculum Committee Chair			
<u>Dr. Tom Hickman</u> .	. _____ .	. _____ .	. _____ .
Faculty Chair			
_____ .	. _____ .	. _____ .	. _____ .
Dean			
<u>Dr. David Sollars</u> .	. _____ .	. _____ .	. _____ .
Other (as necessary)			
_____ .	. _____ .	. _____ .	. _____ .

## New Course Proposal Form

**Course Originator:** Pamela Schmidt

**Department (Area):** School of Business

### 1. Proposed Catalog Description

- a. **Course number:** DA 358
- b. **Title:** Data Methods and Warehousing
- c. **Credits:** 3
- d. **Prerequisites:** DA 348 (Data Discovery and Management)
- e. **Description:** The student will learn methods to process a variety of data types (unstructured and semi-structured) and use technologies that convert, analyze and store large volumes of data. Unstructured and semi-structured data will be converted into information useful for problem solving.

## 2. Resources (Provided by Administration with Faculty Consultation)

- a. **How often offered?** At least one semester per academic year – most likely Spring semesters
- b. **Costs implications (faculty/staffing requirements - full/part-time, etc.):** 1/6 course load. Current faculty may teach the course; technology support will be needed to maintain labs and support students. If new Data Analysis faculty is hired the cost implications are outlined in the Program Pro forma documents.
- c. **Academic qualifications required to teach this course:** Degree in data intensive technology area including Data Analysis, Data Science, Information Systems, Computer Science or Statistics.
- d. **Current faculty that are qualified to teach the course:** Pamela Schmidt, Bob Boncella
- e. **Anticipated enrollment:** 20 students
- f. **Impact on enrollment in other classes:** As this is a required course in the Data Analytics major area of concentration, any impact on other classes would most likely have been seen earlier, as impacted by the prerequisite courses for the data analytics major.
- g. **How might the course be expected to increase enrollment?** Strong demand in the work force for data analytics talent could a) attract some business professionals seeking to expand their skills in data analysis to seek higher paid career opportunities; b) attract new undergraduate students interested in working in jobs in data analytics and related areas; and c) attract undergraduate students (possibly from computer science, technology administration or business) with interest in technology that is not currently met by SOBU offerings.
- h. **If enrollment will not increase where will these students come from?** This major could attract students in the School of Business and attract a few students from outside the school as a secondary area of emphasis and/or a dual major with any other major in the School of Business.
- i. **Signature from Dean's Office** \_\_\_\_\_

### 3. Pedagogy

**a. Academic justification for this course:** Business organizations are under pressure to adapt and respond very quickly to constantly changing environments. Accordingly, they have to make frequent operational, tactical, as well as strategic decisions that will determine their future and fate. Such decisions require considerable amount of data, information, and knowledge.

**b. Learning objectives:**

1. Utilize alternative technologies for data organization and understand ethical, privacy and security issues regarding use of the data.
2. Convert unstructured data into forms useful for solving business problems.
3. Compare and contrast big data capture and storage technologies with data warehousing technologies.
4. Use several information processing tools and models applicable to business management and decision making.
5. Demonstrate ability to write a simple program.

**c. How will the objectives match the School of Business objectives?** This course as part of the Data Analytics major area of concentration supports AACSB expectations to provide business majors with data analysis skills, and technology Agility as required for AACSB Standard 9.

**d. Evaluation instruments (exams, papers, case analyses, projects, presentations, etc.):**

Evaluations  
Homework  
Projects  
Exams  
Final exam

**e. Grading standards:**

A	90% - 100%
B	80% - 90%
C	70% - 80%
D	60% - 70%
F	below 60%

#### 4. Resources

- a. **Added course:** Yes
- b. **If No, what course is this replacing:** N/A
- c. **Type of Course:** Required
- d. **Has the proposed course been offered as a special topics course?** No
- e. **Has the proposing faculty member(s) reviewed the catalogue and determined that the proposed course does not duplicate in title and/or content existing courses?**  
Yes
- f. **Reason for this course:** The course is one of the four courses for the Data Analytics Major Area of Concentration.
- g. **What program does it serve?** Data Analytics Major Area of Concentration
- h. **Textbook:** Proposed course texts under consideration:
  - 1) *Concepts of Database Management*, 9th Edition  
By Joy L. Starks | Philip J. Pratt | Mary Z. Last  
Cengage: Copyright 2019, Published  
MindTap for Concepts of Database Management 6 Mo.  
<https://www.cengage.com/c/concepts-of-database-management-9e-starks/#>
  - 2) *Fundamentals of Python: Data Structures*, 2nd Edition, by Kenneth Lambert (Cengage, 2019)  
ISBN-10: 0357421795  
ISBN-13: 9780357421796  
<https://www.cengage.com/c/fundamentals-of-python-data-structures-2e-lambert/>  
or  
*MindTap for Cengage's Python Fundamentals*, 1st Edition  
Cengage: Copyright 2021, Available January 2020  
Starting At \$100.00  
<https://www.cengage.com/c/mindtap-for-cengage-s-python-fundamentals-1e-cengage/9780357421796/>

- i. **Other required/recommended materials:** Python programming language and huge data sets via Univ. of Arkansas Enterprise Systems website [free to academics and students].
- j. **Library holdings:** Not necessary – due to the nature of the content of the course, vetted online information is sufficient.
- k. **Facilities:** Use of computer labs or use of a personal Windows PC (recent hardware from 2018 or newer) with WINDOWS 10 operating system. Python programming language support, Microsoft SQL database, HANA in-memory computing through SAP University Alliance.



**Data Methods and Warehousing**  
BU 358 SAMPLE SYLLABUS  
*Day and Time*  
*Room*

**Instructor:** Dr.  
**Email:** @washburn.edu  
**Office:** Henderson Learning Center  
**Phone:** 785-670-

**Office Hours:**  
by appointment

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**Course description**

The student will learn methods to process a variety of data types (unstructured and semi-structured) and use technologies that convert, analyze and store large volumes of data. Unstructured and semi-structured data will be converted into information useful for problem solving.

**Prerequisites:** DA 348 Data Discovery and Management

**Course objectives**

By the end of semester, students are expected to be able to:

1. Utilize alternative technologies for data organization and understand ethical, privacy and security issues regarding use of the data.
2. Convert unstructured data into forms useful for solving business problems.
3. Compare and contrast big data capture and storage technologies with data warehousing technologies
4. Use several information processing tools and models applicable to business management and decision making.
5. Demonstrate ability to write a simple program.

**Readings and Materials**

Reading materials either will be assigned or made available to the class as the semester progresses.

**Textbooks**

- 1) *Concepts of Database Management*, 9th Edition  
By Joy L. Starks | Philip J. Pratt | Mary Z. Last  
Cengage: Copyright 2019, Published  
MindTap for Concepts of Database Management 6 Mo.  
<https://www.cengage.com/c/concepts-of-database-management-9e-starks/#>
- 2) *Fundamentals of Python: Data Structures*, 2nd Edition, by Kenneth Lambert (Cengage, 2019)

ISBN-10: 0357421795

ISBN-13: 9780357421796

<https://www.cengage.com/c/fundamentals-of-python-data-structures-2e-lambert/>

or

*MindTap for Cengage's Python Fundamentals*, 1st Edition

Cengage: Copyright 2021, Available January 2020

<https://www.cengage.com/c/mindtap-for-cengage-s-python-fundamentals-1e-cengage/9780357421796/>

### Course Structure

Most classes will be a combination of *lecture*, *discussion* and *lab activities* devoted to data analytics. *Lectures* are intended to integrate concepts *you have already read* in the assigned readings. *Discussion* is an important part of the learning process, and students *are expected to participate actively in class*. Many outside assignments will be hands-on using the technology and are required for success in the class. Students should be self-sufficient in overcoming barriers encountered with technology, should independently seek resources to answer their questions and should support each other in solving technology problems.

### Course Evaluations

A total of 1000 points will be available for students. These points are available throughout the semester and can be earned as follows:

Evaluations	Points	Notes
4 Home works	200	@50 points each
2 Projects	250	@125 points each
2 Mid Exams	300	@150 points each
Final exam	250	
Total	1000	
Class participation (extra)	25	

### DA 358 DRAFT TENTATIVE SCHEDULE\*

Week	Topic	Details
1	Overview of Data methods, programming and datamining	How Data Analytics are performed using scripts, programming with the key role of data management and storage. Review of IMPACT Cycle.
2	Data Formats	Survey of Data types and formats-focus on unstructured and semi-structured data types. Methods fitted to handling different data types.

3	Data Storage Alternatives	Data storage including Data warehouses, Data marts, HADOOP storage for Big Data, HANA in-memory computing, ...
4	SQL for Data management	Introduce Structured Query Language (SQL) for data management and database interactions.
5	SQL for conversions	SQL for Semi-structured Data conversion and processing, HADOOP
6	SQL for Data Queries and calculations	SQL used for Extraction, Transformation, and Loading (ETL) to load data into a Database
7	SQL for Data Summary and reporting	SQL used for filtering, calculating, summarization and combining data
8	Textual Analysis	Text analysis of unstructured content (from social media, web data)
9	A/V Media Data	Profiling, Data processing issues with Media (video, audio, image...)
10	Programming Concepts	Intro to Programming Concepts, fundamentals
11	Programming	Programming for data management and transformation
12	Programming	Programming for competition and analysis
13	Programming Reports	Programming: Generating summary reports
14	Semi-Structured Data	Unstructured Data collection, storage, conversion and processing, HADOOP
15	Data Governance	Data Governance, Ethics, Privacy and Security, Team case study(ies)
16	<b>FINAL EXAM</b>	

\*Tentative and subject to change.

## New Course Approval Routing Form

Course Number DA 368

Course Title: **Data Mining and Modeling**

Course Originator: **Bob Boncella**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name (print)	Recommendation	Signature	Date
Faculty	Approved/Not Approved		
<u>Dr. Gail Hoover King</u> .	_____ .	_____ .	_____ .
<u>Dr. Pamela Schmidt</u> .	_____ .	_____ .	_____ .
<u>Dr. Bob Boncella</u> .	_____ .	_____ .	_____ .
<u>Dr. Rosemary Walker</u> .	_____ .	_____ .	_____ .
<u>Dr. Akhadian Harnowo</u> .	_____ .	_____ .	_____ .
_____ .	_____ .	_____ .	_____ .
Curriculum Committee Chair			
<u>Dr. Tom Hickman</u> .	_____ .	_____ .	_____ .
Faculty Chair			
_____ .	_____ .	_____ .	_____ .
Dean			
<u>Dr. David Sollars</u> .	_____ .	_____ .	_____ .
Other (as necessary)			
_____ .	_____ .	_____ .	_____ .

## New Course Proposal Form

**Course Originator:** Bob Boncella

**Department (Area):** School of Business

### 1. Proposed Catalog Description

- a. **Course number:** DA 368
- b. **Title:** Data Mining and Modeling
- c. **Credits:** 3
- d. **Prerequisites:** DA 348 (Data Discovery and Management)
- e. **Description:** The student will learn technologies that can be used to discover relationships among data. These relations can be used to create models used to predict or classify new data.

## 2. Resources (Provided by Administration with Faculty Consultation)

- a. **How often offered?** At least one semester per academic year – most likely Fall semester
- b. **Costs implications (faculty/staffing requirements - full/part-time, etc.):** 1/6 course load for faculty teaching, data analytics software and data sources
- c. **Academic qualifications required to teach this course:** Degree in the area of data analysis or data science, Information Systems or Computer Science, with skills in statistical analysis and knowledge of the methodology and technology used to carry out descriptive analytics, predictive analytics, and prescriptive analytics supporting the management decision-making process.
- d. **Current faculty that are qualified to teach the course:** Dr. Rosemary Walker, Dr. Akhadian Harnowo, Dr. Bob Boncella
- e. **Anticipated enrollment:** 20 students
- f. **Impact on enrollment in other classes:** As this is a required course in the Data Analytics major area of concentration, any impact on other classes would most likely have been seen earlier, as impacted by the prerequisite courses for the data analytics major.
- g. **How might the course be expected to increase enrollment?** Strong demand in the work force for data analytics talent could a) attract some business professionals seeking to expand their skills in data analysis to seek higher paid career opportunities; b) attract new undergraduate students interested in working in jobs in data analytics and related areas; and c) attract savvy undergraduate students (possibly from computer science, technology administration or business) with interest in technology that is not currently met by SOBU offerings.
- h. **If enrollment will not increase where will these students come from?** This major could attract students in the School of Business, attract a few students from outside the school as a secondary area of emphasis and/or a dual major with any other major in the School of Business.
- i. **Signature from Dean's Office** \_\_\_\_\_

### 3. Pedagogy

**a. Academic justification for this course:** Business organizations are under pressure to adapt and respond very quickly to constantly changing environments. Accordingly, they have to make frequent operational, tactical, as well as strategic decisions that will determine their future and fate. Such decisions require considerable amount of data, information, and knowledge.

**b. Learning objectives:**

1. Explain the different methods and techniques for analyzing data
2. Identify the appropriate modeling and analysis tools
3. Use analytical methods to discover relationships among data
4. Create classification and predictive models
5. Create models used for data analysis

**c. How will the objectives match the School of Business objectives?** This course as part of the Data Analytics area of concentration supports AACSB expectations to provide business majors with data analysis skills and technology agility as required for AACSB Standard 9.

**d. Evaluation instruments (exams, papers, case analyses, projects, presentations, etc):**

Evaluations

Homework

Projects/Case Study

Exams

**e. Grading standards:**

A	90% -100%
B	80% - 90%
C	70% - 80%
D	60% - 70%
F	below 60%

#### 4. Resources

- a. **Added course:** Yes
- b. **If No, what course is this replacing:** N/A
- c. **Type of Course:** Required
- d. **Has the proposed course been offered as a special topics course?** No. However, courses with some similar learning objectives have been offered as special topics. About 80% of course material is similar.  
  
*BU 403 Essentials of Business Data Analytics Spring 2018 – enrollment 5*  
*BU 403 Essentials of Business Data Analytics Spring 2019 – enrollment 8*
- e. **Has the proposing faculty member(s) reviewed the catalogue and determined that the proposed course does not duplicate in title and/or content existing courses?**  
Yes
- f. **Reason for this course:** The course is one of the four courses for the Data Analytics Major Area of Concentration.
- g. **What program does it serve?** Data Analytics Major Area of Concentration
- h. **Textbook:** Similar to *Essentials of Business Analytics 2<sup>nd</sup>*
- i. **Other required/recommended materials:** None
- j. **Library holdings:** Not necessary – due to the nature of the content of the course, vetted online information is sufficient.
- k. **Facilities:** computer lab and equipment necessary to run the appropriate Data Analytic tools (e.g., Power BI, Analytic Solver, SPSS, SAP, et al.)



**Data Mining and Modeling**  
DA 368 SAMPLE SYLLABUS  
*Day and Time*  
*Room*

**Instructor:** Dr.  
**Email:** @washburn.edu  
**Office:** Henderson Learning Center  
**Phone:** 785-670-

**Office Hours:**  
by appointment

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**Course description**

The student will learn technologies that can be used to discover relationships among data. These relations can be used to create models used to predict or classify new data.

**Prerequisites:** DA 348 Data Discovery and Management

**Course objectives**

By the end of semester, students are expected to be able to:

1. Explain the different methods and techniques for analyzing data
2. Identify the appropriate modeling and analysis tools
3. Use analytical methods to discover relationships among data
4. Create classification and predictive models
5. Create models for data analysis

**Readings and Materials**

Reading materials either will be assigned or made available to the class as the semester progresses.

**Textbook *Similar to:***

*Essentials of Business Analytics 2<sup>nd</sup>*

**Course Structure**

The course will consist of lectures over business data analytics topics and discussion/problem sessions based on pre-chapter and post-chapter case studies.

**Course Evaluation**

The assessment will be based on two exams, homework exercises, & projects.

- 25% Homework & Case Problems
- 25% Mid-term Exam
- 50% Final Exam

**DA 368 DRAFT TENTATIVE SCHEDULE\***

<b>Week</b>	<b>Topics/Details</b>
Week 1	Introduction Data modeling and mining
Week 2	Data Models using technology Descriptive Statistics
Week 3	
Week 4	
Week 5	Data Visualization
Week 6	
Week 7	Midterm Exam
Week 8	Descriptive Data Mining
Week 9	Linear Regression
Week 10	
Week 11	Predictive Data Mining
Week 12	
Week 13	Probability: An Introduction to Modeling Uncertainty
Week 14	Decision Analysis
Week 15	Statistical Inference
Week 16	Final

**\*Tentative and subject to change**

## New Course Approval Routing Form

Course Number: **DA 348**

Course Title: *Data Discovery and Management*

Course Originator: **Akhadian Harnowo**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name (print)	Recommendation	Signature	Date
Faculty	Approved/Not Approved		
<u>Dr. Gail Hoover King</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Pamela Schmidt</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Bob Boncella</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Rosemary Walker</u> .	. _____ .	. _____ .	. _____ .
<u>Dr. Akhadian Harnowo</u> .	. _____ .	. _____ .	. _____ .
_____ .	. _____ .	. _____ .	. _____ .
Curriculum Committee Chair			
<u>Dr. Tom Hickman</u> .	. _____ .	. _____ .	. _____ .
Faculty Chair			
_____ .	. _____ .	. _____ .	. _____ .
Dean			
<u>Dr. David Sollars</u> .	. _____ .	. _____ .	. _____ .
Other (as necessary)			
_____ .	. _____ .	. _____ .	. _____ .

## New Course Proposal Form

**Course Originator:** Akhadian Harnowo

**Department (Area):** School of Business

### 1. Proposed Catalog Description

- a. **Course number:** DA 348
- b. **Title:** Data Discovery and Management
- c. **Credits:** 3
- d. **Prerequisites:** CM 105 or CM 111, EC211, BU248, BU250
- e. **Description:** In this course, students will identify and manipulate data that will provide actionable information to solve business problems.

## 2. Resources (Provided by Administration with Faculty Consultation)

- a. **How often offered?** Two times per year Fall and Spring Semesters
- b. **Costs implications (faculty/staffing requirements - full/part-time, etc.):** 2/6 full time faculty load. Current faculty will teach the course; technology support will be needed to maintain labs and support students.

**NOTE: To implement this course and other courses in Data Analytics successfully, a Data Analysis Administration Specialist from IT Department is needed for curriculum and technical support to install, administer and maintain the technologies, systems and data sets.**

- c. **Academic qualifications required to teach this course:** Degree in the area of data analysis or data science, Information Systems or Computer Science, with skills in data sources supporting the management decision-making process and knowledge of ETL techniques and software.
- d. **Current faculty that are qualified to teach the course:** Akhadian Harnowo, Pamela Schmidt, Rosemary Walker
- e. **Anticipated enrollment:** 20 students
- f. **Impact on enrollment in other classes:** This is the first required course in the Data Analytics major area of concentration. The new major area of concentration is expected to attract students to Washburn University. In addition, the course may also draw students wanting a second major area of concentration.
- g. **How might the course be expected to increase enrollment?** Strong demand in the work force for data analytics talent could a) attract some business professionals seeking to expand their skills in data analysis to seek higher paid career opportunities; b) attract new undergraduate students interested in working in jobs in data analytics and related areas; and c) attract undergraduate students (possibly from computer science, technology administration or business) with interest in technology that is not currently met by SOBU offerings.
- h. **If enrollment will not increase where will these students come from?** This major could attract students in the School of Business and attract a few students from outside the school as a secondary area of emphasis and/or a dual major with any other major in the School of Business.
- i. **Signature from Dean's Office** \_\_\_\_\_

### 3. Pedagogy

**a. Academic justification for this course:** Business organizations are under pressure to adapt and respond very quickly to constantly changing environments. Accordingly, they have to make frequent operational, tactical, as well as strategic decisions that will determine their future and fate. Such decisions require considerable amount of data, information, and knowledge.

**b. Learning objectives:**

1. Find sources of data
2. Identify file types and data formats used for solving business problems
3. Demonstrate different methods for data collection
4. Prepare data (Extract, Transform, and Load) for analysis purposes
5. Demonstrate methods that transform different types of data into useful/actionable information
6. Identify legal, ethical and secure means for managing data

**c. How will the objectives match the School of Business objectives?** This course as part of the Data Analytics major area of concentration supports AACSB by providing business majors with data analysis skills and technology agility as required for AACSB Standard 9.

**d. Evaluation instruments (exams, papers, case analyses, projects, presentations, etc.):**

Evaluation based on:

Homework

Projects

Exams

Final exam

**e. Grading standards:**

A	90% -100%
B	80% - 90%
C	70% - 80%
D	60% - 70%
F	below 60%

#### 4. Resources

- a. **Added course:** Yes
- b. **If No, what course is this replacing:** N/A
- c. **Type of Course:** Required
- d. **Has the proposed course been offered as a special topics course?** No
- e. **Has the proposing faculty member(s) reviewed the catalogue and determined that the proposed course does not duplicate in title and/or content existing courses?** Yes
- f. **Reason for this course:** This course is the first course in the Data Analytics Major Area of Concentration. In this course, students will identify and manipulate data that will provide actionable information to solve business problems.
- g. **What program does it serve?** Data Analytics Major Area of Concentration
- h. **Textbook:** Books similar to the following:  
Sharda, R., Delen, D., Turban, E., 2015. *Analytics, Data Science, & Artificial Intelligence*. 11<sup>th</sup> edition. Hoboken, NJ: Pearson Education. ISBN: 978-0-13-519201-6
- i. **Other required/recommended materials:** None
- j. **Library holdings:** Not necessary – due to the nature of the content of the course, vetted online information is sufficient.
- k. **Facilities:** Computer labs, access to technology, data sets, online homework management system, online resources (e.g. textbook, videos), data analytics tools (e.g. Excel, Power BI, et al.)

## Data Discovery and Management

DA 348 SAMPLE SYLLABUS

*Day and Time*

*Room*

**Instructor:** Dr.

**Email:** @washburn.edu

**Office:** Henderson Learning Center

**Phone:** 785-670-

**Office Hours:**

by appointment

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### Course description

In this course, students will identify and manipulate data that will provide actionable information to solve business problems.

**Prerequisites:** CM 105 or CM 111, EC211, BU248, BU250

### Course objectives

By the end of semester, students are expected to be able to:

1. Find sources of data
2. Identify files types and data formats used for solving business problems
3. Demonstrate different methods for data collection
4. Prepare data (Extract, Transform, and Load) for analysis purposes
5. Demonstrate methods that transform different types of data into useful/actionable information
6. Identify legal, ethical and secure means for managing data

### Readings and Materials

Reading materials either will be assigned or made available to the class as the semester progresses.

### Textbooks *Similar to:*

1. Sharda, R., Delen, D., Turban, E., 2015. *Analytics, Data Science, & Artificial Intelligence*. 11<sup>th</sup> edition. Hoboken, NJ: Pearson Education.  
ISBN: 978-0-13-519201-6

### Course Structure

Most classes will be a combination of lecture, discussion and lab activities devoted to data analytics. Lectures are intended to integrate concepts you have already read in the assigned readings. Discussion is an important part of the learning process, and students are expected to participate actively in class.



### Course Evaluations

A total of 1000 points will be available for students. These points are available throughout the semester and can be earned as follows:

Evaluations	Points	Notes
2 Home works	200	@100 points each
2 Projects	250	@125 points each
2 Mid Exams	300	@150 points each
Final exam	250	
Total	1000	
Class participation (extra)	25	

DA 348 DRAFT TENTATIVE SCHEDULE*		
Week	Topic	Details
1	Intro to Data Analytics	How Data Analytics Affects Business, The Data Analytics Process Using the IMPACT Cycle,
2	Data Mining	Nature of Data, data discovery
3	Data Mining	Data discovery, data collection
4	Data Mining	Data discovery, data collection
5	Data Preparation dealing with Gaps, corrupt, outliers ... and Cleaning	Structured Data, Relational Database, Data Dictionaries
6	Data Preparation and Cleaning	Extraction, Transformation, and Loading (ETL) of Data
7	Data Preparation and Cleaning	Extraction, Transformation, and Loading (ETL) of Data
8	Modeling and Evaluation	Profiling, Descriptive stats, Data reduction, regression
9	Modeling and Evaluation	Profiling, Descriptive stats, Data reduction, regression
10	Modeling and Evaluation	Profiling, Descriptive stats, Data reduction, regression,
11	Visualization	Using Visualizations and Summaries to Share Results with Stakeholders
12	Visualization	Using Visualizations and Summaries to Share Results with Stakeholders

13	Visualization	Charts, tools, communication
14	Key Performance Indicators	Generating KPI to answer business questions
15	Ethics	Caveats of Analytics and AI Implementation Issues: From Ethics and Privacy to Organizational and Societal Impacts
16	<b>FINAL EXAM</b>	

\*Tentative and subject to change.