Business Management 2321
Business Analytics
Autumn 2017 – Lecture Sections 4533, 4534, 4814, 4538

Instructors	Dr. Mark Jacobs, PhD & Prof. Terry Klinker, COL, US Army (Ret)
E-mail Address	FCOB-BusMGT2321@osu.edu
TAs	Names, schedules, office posted on Carmen
Course Text	Required: **"Business Analytics"** – A Customized Version of <u>Spreadsheet Modeling for Business Decisions</u>, 5th Edition, by John F. Kros, ISBN 978-1-4652-9977-2 - This is an on-line version of the book, with only the chapters we will cover in the course. We developed this to reduce the price to students ($75 vs the $100-200 for previous texts) and to include on-line quizzes. You must sign up for this on-line version to gain access to required assignments. Optional: <u>Spreadsheet Modeling for Business Decisions</u>, 5th Edition, by John F. Kros ISBN 978-1-4652-6055-0 - This is not necessary. If you prefer a copy of the book in your hands, you may find it helpful. You may purchase older versions if you prefer; we will work from the 5th edition.
Software	Microsoft EXCEL with the SOLVER add-in.

Note: The classroom is "electronics free" during lectures - laptop computers or cell phones will not be allowed. Any student violating this policy may be asked to leave the classroom.

COURSE INTRODUCTION

The field of data analytics has its roots in the 1940's, primarily in wartime logistics. Since then, data analysis, analytic techniques and expanded methodologies are increasingly implemented into the business world. Decisions based on operations research models are proven to increase revenues, decrease costs, and significantly impact the fiscal health of business organizations.

Data Analytics models are not limited to of operations - models are used in the fields of finance, tax, marketing, human resources, materials, and logistics. Professions in health care, government, and transportation organizations benefit from the use of these models, and the ability to construct them. Recent computer software developments, combined with the rapidity with which data may now be collected, transferred, and shared, has opened the floodgates to the use of data analytics. Most CEOs of the Forbes Top 50 have several data analytics books listed on their list of required reading for senior executives. Students who master the material presented in the course will have a competitive advantage over their peers both in school and in their future careers.

The objective of the course is to familiarize you with several major decision modeling techniques, how to gather data for such models, how to derive and assemble the models, and how to interpret the results and make decisions using the results. Several of the techniques taught in this course are currently used in major corporations on very large scales. In addition, the integration of Microsoft EXCEL (along with the "Goal Seek" and "Solver" add-ins) makes this course an important foundation for future courses at Fisher as well as various business careers.

Prior to his academic career, Dr. Jacobs held positions in the manufacturing and services industries. Beginning with IBM and including 3M, Cap Gemini Ernst & Young, and Cummins Engine, Dr. Jacobs has held a variety of positions of increasing responsibility culminating in his position as chief operating officer at JL Analytical Services. Prior to his academic career, he held positions in the manufacturing and services industries. Beginning with IBM and including 3M, Cap Gemini Ernst & Young, and Cummins Engine, Dr. Jacobs has held a variety of positions of increasing responsibility culminating in his position as chief operating officer at JL Analytical Services.

Professor Klinker has over 30 years of experience in industry, services, and military planning and operations. He have seen the area of modeling develop from a very specialized field, done by a small number of individuals, to a necessary tool to complete in the business world.

PROCEDURES

Students taking BusMGT 2321 are either business majors or persons interested in operations. We will treat each of our class sessions as *business meetings*. As the *meeting leader*, instructors are expected to post an agenda and state the expectations, or end state, for each meeting. You will find those expectations in the course schedule. As *meeting attendees* you are to be prepared for each meeting, to include reading all materials, bringing ideas and questions regarding the material, and completing all deliverables (i.e. assignments, individual practical examples, etc.) prior to the beginning of each class. Meeting attendees are expected to arrive on time and be prepared for the meeting to start as scheduled.

Cell phones and other distractions are not acceptable in business meetings. Turn cell phones off or place them on silent (not vibrate) and remove them from your desk. If you have a legitimate reason that any correspondence cannot be delayed during our classes (i.e. your wife is 8.99999 months pregnant and you are waiting for the "go" call), let the instructor know before class. Personal computers and electronic pads are not allowed during class unless you are told to bring them for a specific subject.

You should be properly attired for class – others perception of you as a business professional will depend, in some part, on your appearance. Unacceptable attire for business meetings includes, but is not limited to, hats, revealing or workout clothes, offensive clothing, etc. Some of these standards are, admittedly, subjective. Remember, you want to start preparing for the business world. There are often future employers on the Fisher campus. Should you be introduced, what impression do you wish to make?

Our classroom expectations parallel the professional attitude your future employers will demand. Our expectations of you, as business professionals, are high, but never higher than the expectations you should put on yourself.

COURSE FORMAT

BusMGT 2321 format for Autumn Semester 2017:

- General format:
    - The course runs the entire semester, 16 weeks plus Finals Week
    - The course has one weekly required lecture
    - The course has one weekly optional recitation

- There are 4 graded components

    - Exams – two midterms (15% each) and one final (20%) – 50% of your grade

    - Practical Exercises – three practical exercises (10% each) – 30% of your grade

    - Model Building Exercises – a sequence of 10 models (1% each) – 10% of your grade

    - On-line Quizzes – a sequence of 10 quizzes (1% each) – 10% of your grade

- The course presentation has three components

    - Video lectures - A series of 10-15 minute lectures to be viewed before weekly lectures, each concentrating on one key point from the text

    - Weekly lectures - Face-to-face time with the instructors where we work problems, both individually and in groups, develop key points, and answer questions (1hr 20min)

    - Weekly recitations - Optional meetings with Teaching Assistants; recitations include a problem and solution pertaining to the week's subject matter and a question and answer period (55min)

For example, network modeling includes a series of video lectures, from which students should understand the differences in the models, how to set up such models, and then apply the models in a Practical Exercise. During lecture we will present specific issues with these models and work one together. Recitations will provide additional practice and time to interact with TAs or fellow students on specific issues.

MISCELLANEOUS

Calculator:

It is the *student's* responsibility to bring a functioning calculator to each exam. The instructor will not provide a replacement calculator, batteries, nor will students be allowed to share calculators during an exam. If you haven't replaced the batteries in your calculator since high school, buy batteries later today. *The use of PDA's, MP3 players, and cell phones as calculators are prohibited during exams!* All student materials other than a calculator, extra pencils, and an eraser must be packed away prior to the entering the exam classroom.

Cell Phones:

Cell phones must be turned off during class. If you are expecting to receive an important phone call or text message during class, please leave the classroom to answer the call or read the text message. Any student seen texting or using a cell phone during class will be asked to leave the classroom. During exams, all cell phones must be turned off and stored in the students' book bags.

iPods/MP3 Players:

No iPods or other MP3 players are to be in use during class or exams.

Disability Services (ODS):

If you use the Office of Disability Services, please submit all forms by the 2nd lecture. You may submit the form during lecture, during office hours, or in Room 600 Fisher Hall (ask the office staff to place it in Professor Klinker's mailbox). We may or may not sign ODS forms after the 2nd week of class. Understand that without prior arrangement, special accommodation will not be given by ODS or the instructors.

Academic Misconduct:

Your instructors and the Management Sciences Department expect professional and ethical behavior in this class at all times. We have found that most students are honest and do their own work and that they appreciate knowing that we take academic misconduct very seriously. The Management Sciences Department and the University follow a standard procedure for those who choose not to behave ethically. The student code of conduct can be found on the Internet at *studentaffairs.osu.edu/resource_csc.asp* . A link to this website will be placed on Carmen.

STUDENT ATHLETES

Student athletes must have their coach or other athletic department representative submit a letter with all scheduled competitions and scheduled practices by the 2nd week of class. Exam conflicts with varsity athlete competitions will be handled on an individual basis only after receiving official notification from the athletic department.

Athletes participating in club sports are not excused from exams and/or individual assignments.

STUDENT GRIEVENCE PROCEDURE

If a student has a specific problem with the administration of this class, the student has the right to discuss the problem with Fisher faculty and staff. The first step in the process is to discuss the problem with the instructor. If the problem cannot be resolved, the next step is to discuss the problem with the Management Sciences department chairperson (Dr. Kenneth Boyer), and then followed be a representative from the Fisher College Deans Office. Failure to follow this progression will usually result in delays in achieving problem resolution or the problem going unresolved.

MAIL

If we are not in our offices, **DO NOT** slide papers, assignments, etc. under our office doors. Please take all papers to the receptionist in the Management Sciences office (600 Fisher Hall). The office staff will time-stamp the papers and will put them into the appropriate Management Sciences mailbox.

BusMGT 2321 - Businesss Analytics
Autumn Semester 2017
Tuesday, 9:35am Lecture (Section 4533)

	Date	Topics	Videos	Items Due
Session 1	8/22/2017 Tuesday	**Module 1: Decision Analysis** Effective Problem Solving The Decision Modeling Process Break Even & Indifference Points Spreadsheet Applications Reports	Video - Break Even Points Video - Indifference Points Video - Indifference Tables Video - 5 Steps in Decision Making Video - Applying the 5 Steps	Quiz 1
Session 2	8/29/2017 Tuesday	**Module 2: Modeling/Presentation** Payoff Tables Decision Making Under Risk, Uncertainty, & Certainty Decision Trees Critical Path Method (CPM) Gant Charts MS Project	Video - Decision Making Under Uncertainty Video - Decision Making Under Risk Video - Decision Making Under Risk - Graphic Soln Video - Decision Making Under Certainty Video - Decision Trees	MBE1 Quiz 2
Session 3	9/5/2017 Tuesday	**Module 3: Linear System & Solutions** Foundations of Optimization Models Linear Programming Graphic Solutions & Sensitivity Spreadsheet Solutions & Solver	Video - Uses and Benefits Video - Properties and Assumptions Video - Sample Problem Introduction Video - Graphing Video - Graphic Solution Video - Types of Solutions	MBE2 Quiz 3
Session 4	9/12/2017 Tuesday	**Module 4: Linear Solutions & Sensitivity** Foundations of Optimization Models Linear Programming Graphic Solutions & Sensitivity Spreadsheet Solutions & Solver	Video - Sensitivity Analysis (all 4)	PE #1 (Ind) MBE3 Quiz 4
Session 5	9/19/2017 Tuesday	**Midterm Exam #1**		
Session 6	9/26/2017 Tuesday	**Module 5: Business Models & Solver** Basic Businesss Models	Videos - TBD	MBE4 Quiz 5
Session 7	10/3/2017 Tuesday	**Module 6: Sensitivity & Solver** Basic Business Models	Videos - TBD	MBE5 Quiz 6
	10/10/2017 Tuesday	**No Lecture - Semester Break**		

Session 8	10/17/2017 Tuesday	**Module 7: Network Models**
		Networking Models
		   Transportation & Logistics Applications
		   Assignment Problems
		   Integer and Binary Applications
			Videos - Network Models, Parts 1 & 2
			Videos - Tranportation Models, Parts 1 & 2
			Videos - Assignments Models, Parts 1, 2, & 3
			Videos - Maximum Flow Models, Parts 1 & 2
			Videos - Shortest Path Models, Parts 1 & 2
				MBE6
				Quiz 7

Session 9	10/24/2017 Tuesday	**Module 8: Multiple Criteria Models**	Videos - Goal Programming (all 4)	PE2 (Grp) MBE7 Quiz 8
Session 10	10/31/2017 Tuesday	**Midterm Exam #2**		EXAM
Session 11	11/7/2017 Tuesday	**Module 9: Simulation** Introduction to Simulation Types of Data Monte Carlo simulation Random Number Generation Probability Distributions Basic Spreadsheet Models	Videos - TBD	MBE8 Quiz 9
Session 12	11/14/2017 Tuesday	**Module 10: Replication and Scenario Manager** Replication Scenario Manager Advanced Spreadsheet Models	Videos - TBD	MBE9 Quiz 10
	11/21/2017 Tuesday	**No Classes - Thankgiving Break**		
Session 13	11/28/2017 Tuesday	**Course Review** Makeup as necessary Review for Final Exam		PE 3 - (Grp) MBE10
Final	12/12/2017 Tuesday	**Final Exam - Cumulative**	Location TBA, 8am-9:45am	EXAM

BusMGT 2321 - Business Analytics

Spring Semester 2017
Tuesday, 7:05pm Lecture (Section 4814)

	Date	Topics	Videos	Items Due
Session 1	8/22/2017 Tuesday	**Module 1 - Decision Analysis** Effective Problem Solving The Decision Modeling Process Break Even & Indifference Points Spreadsheet Applications Reports	Video - Break Even Points Video - Indifference Points Video - Indifference Tables Video - 5 Steps in Decision Making Video - Applying the 5 Steps	Quiz 1
Session 2	8/29/2017 Tuesday	**Module 2 - Modeling/Presentation** Payoff Tables Decision Making Under Risk, Uncertainty, & Certainty Decision Trees Critical Path Method (CPM) Gant Charts MS Project	Video - Decision Making Under Uncertainty Video - Decision Making Under Risk Video - Decision Making Under Risk - Graphic Soln Video - Decision Making Under Certainty Video - Decision Trees	MBE1 Quiz 2
Session 3	9/5/2017 Tuesday	**Module 3 -Linear System & Solutions** Foundations of Optimization Models Linear Programming Graphic Solutions & Sensitivity Spreadsheet Solutions & Solver	Video - Uses and Benefits Video - Properties and Assumptions Video - Sample Problem Introduction Video - Graphing Video - Graphic Solution Video - Types of Solutions	MBE2 Quiz 3
Session 4	9/12/2017 Tuesday	**Module 4 -Linear Solutions & Sensitivity** Foundations of Optimization Models Linear Programming Graphic Solutions & Sensitivity Spreadsheet Solutions & Solver	Video - Sensitivity Analysis (all 4)	PE #1 (Ind) MBE3 Quiz 4
Session 5	9/19/2017 Tuesday	**Midterm Exam #1**		

Session 6	9/26/2017 Tuesday	**Module 5 - Business Models & Solver**
		 Basic Businesss Models
		    Financial Applications
		    Marketing Applications
		    Production Applications
		    Staffing Applications
		    Materials Applications
			Videos - TBD	MBE4
				 Quiz 5

Session 7	10/3/2017 Tuesday	**Module 6 - Sensitivity & Solver**
		 Basic Business Models
		    Marketing Applications
		    Production Applications
		    Staffing Applications
		    Materials Applications
				MBE5
				 Quiz 6

	10/10/2017 Tuesday	**No Lecture - Semester Break**		

Session 8	10/17/2017 Tuesday	**Module 7 - Network Models**
		 Networking Models
		    Transportation & Logistics Applications
		    Assignment Problems
		    Integer and Binary Applications
			Videos - Network Models, Parts 1 & 2
			 Videos - Tranportation Models, Parts 1 & 2
			 Videos - Assignments Models, Parts 1, 2, & 3
			 Videos - Maximum Flow Models, Parts 1 & 2
			 Videos - Shortest Path Models, Parts 1 & 2
				MBE6
				 Quiz 7

Session 9	10/24/2017 Tuesday	**Module 8 - Multiple Criteria Models** Sensitivity Analysis		PE2 (Grp) MBE7 Quiz 8
Session 10	10/31/2017 Tuesday	**Midterm Exam #2**		EXAM
Session 11	11/7/2017 Tuesday	**Module 9 - Simulation** Introduction to Simulation Types of Data Monte Carlo simulation Random Number Generation Probability Distributions Basic Spreadsheet Models	Videos - TBD	MBE8 Quiz 9
Session 12	11/14/2017 Tuesday	**Module 9 - Simulation** Replication Scenario Manager Advanced Spreadsheet Models	Videos - TBD	MBE9 Quiz 10
	11/21/2017 Tuesday	**No Classes - Thankgiving Break**		
Session 13	11/28/2017 Tuesday	**Course Review** Makeup as necessary Review for Final Exam		PE 3 - (Grp) MBE10

BusMGT 2321 - Business Analytics

Spring Semester 2017
Tuesday, 5:30pm Lecture (Section 4538)

	Date	Topics	Videos	Items Due
Session 1	8/24/2017 Thursday	**Module 1 - Decision Analysis** Effective Problem Solving The Decision Modeling Process Break Even & Indifference Points Spreadsheet Applications Reports	Video - Break Even Points Video - Indifference Points Video - Indifference Tables Video - 5 Steps in Decision Making Video - Applying the 5 Steps	Quiz 1
Session 2	8/31/2017 Thursday	**Module 2 - Modeling/Presentation** Payoff Tables Decision Making Under Risk, Uncertainty, & Certainty Decision Trees Critical Path Method (CPM) Gant Charts MS Project	Video - Decision Making Under Uncertainty Video - Decision Making Under Risk Video - Decision Making Under Risk - Graphic Soln Video - Decision Making Under Certainty Video - Decision Trees	MBE1 Quiz 2
Session 3	9/7/2017 Thursday	**Module 3 -Linear System & Solutions** Foundations of Optimization Models Linear Programming Graphic Solutions & Sensitivity Spreadsheet Solutions & Solver	Video - Uses and Benefits Video - Properties and Assumptions Video - Sample Problem Introduction Video - Graphing Video - Graphic Solution Video - Types of Solutions	MBE2 Quiz 3
Session 4	9/14/2017 Thursday	**Module 4 -Linear Solutions & Sensitivity** Foundations of Optimization Models Linear Programming Graphic Solutions & Sensitivity Spreadsheet Solutions & Solver	Video - Sensitivity Analysis (all 4)	PE #1 (Ind) MBE3 Quiz 4
Session 5	9/21/2017 Thursday	**Midterm Exam #1**		
Session 6	9/28/2017 Thursday	**Module 5 - Business Models & Solver** Basic Businesss Models Financial Applications Marketing Applications Production Applications Staffing Applications Materials Applications	Videos - TBD	MBE4 Quiz 5
Session 7	10/5/2017 Thursday	**Module 6 - Sensitivity & Solver** Basic Businesss Models Marketing Applications Production Applications Staffing Applications Materials Applications		MBE5 Quiz 6
	10/12/2017 Thursday	**No Lecture - Semester Break**		
Session 8	10/19/2017 Thursday	**Module 7 - Network Models** Networking Models Transportation & Logistics Applications Assignment Problems Integer and Binary Applications	Videos - Network Models, Parts 1 & 2 Videos - Tranportation Models, Parts 1 & 2 Videos - Assignments Models, Parts 1, 2, & 3 Videos - Maximum Flow Models, Parts 1 & 2 Videos - Shortest Path Models, Parts 1 & 2	MBE6 Quiz 7
Session 9	10/26/2017 Thursday	**Module 8 - Multiple Criteria Models** Sensitivity Analysis		PE2 (Grp) MBE7 Quiz 8
Session 10	11/2/2017 Thursday	**Midterm Exam #2**		EXAM
Session 11	11/9/2017 Thursday	**Module 9 - Simulation** Introduction to Simulation Types of Data Monte Carlo simulation Random Number Generation Probability Distributions Basic Spreadsheet Models	Videos - TBD	MBE8 Quiz 9
Session 12	11/16/2017 Thursday	**Module 9 - Simulation** Replication Scenario Manager Advanced Spreadsheet Models	Videos - TBD	MBE9 Quiz 10
	11/23/2017 Thursday	**No Classes - Thankgiving Break**		
Session 13	11/30/2017 Thursday	**Course Review** Makeup as necessary Review for Final Exam		PE 3 - (Grp) MBE10