Lincoln University

BA 460 – Quantitative Methods for Business and Finance Management

COURSE SYLLABUS
Spring 2020

Instructor:	Prof. Aharon Hibshoosh, Ph.D.
Lecture Schedule:	Tuesday, Thursday (1/21-3/5)*, 15:30-18:15
Credits:	4 units / 3 units - 45 lecture hours and 1 unit individual research project (required)
Level:	Mastery 2/ Research (M2R)
Office Hours:	Tuesday, Thursday: 21:15 - 23:15
	e-mail: ahibshoosh@lincolnuca.edu
	Phone: (510) 712 4410
Textbooks:	David R. Anderson, Dennis J. Sweeney, Jeffrey D. Camm, James J. Cochran, Michael J. Fry and Jeffrey W. Ohlmann (2015) *An Introduction to Management Science: Quantitative Approaches to Decision Making, 14th ed.*, ISBN-10: 1111823618 | ISBN-13: 9781111823610, Cengage Learning.
	Recommended Textbook: Lawrence L. Lapin and William D. Whisler. (2002) _Quantitative Methods for Business Decisions,_ 7th ed., Belmont CA: Duxbury, Thomson Learning. (ISBN 0-534-38024-7).
Last Revision:	January12, 2020

*Final's date 3/17

CATALOG DESCRIPTION

While solving a problem, managers must consider both qualitative and quantitative factors. This course covers quantitative methods which help to solve different business problems. Techniques include decision analysis, regression analysis, forecasting, transportation, and assignment models, Markov Analysis, stochastic equations, statistical quality control and others. A one-unit written research project and its oral presentation are required for the course. (4 units). *Prerequisite: BA 115 or BA 241*

COURSE DESCRIPTION

BA 460 introduces the students to formal mathematical and statistical reasoning in Business. It familiarizes the student with methods of decisions and measurement as applied in models that are widely used by decision-makers in industry and business. Special attention is given to applications in Financial Management. These are strongly affecting decision making in

other disciplines, e.g., Marketing, Logistics, Management, and Production. The course requires elementary knowledge in mathematics and statistics on which we will build further knowledge. The course culminates in an individual project, where the student is given the opportunity to study in greater statistical and or mathematical depth some assigned topic.

Several key topics in Operations Research and statistics are covered and applied. There is an emphasis on both procedure and rationale. The student is trained in problem formation and setting and in the usage of procedures and algorithms in the solution of the problems. The student thus needs to pay attention to the rationale in problem's setting as well as to the rationale embedded in the algorithmic process.

EDUCATIONAL OBJECTIVES

The objective of this course is to provide the graduate student with education and experience essential for operations research and application in business and in particular in finance. The course has an important project requirement on top of the familiarity gained by problem solving. First, the course seeks to solidify the mathematical knowledge of the students in algebra, geometry, statistics, and computer science and to bring the student to use those in the mathematical formation and solution of business problem. Hence, student should be able to read business situations, and systematically and rigorously form mathematical models that address them. The student should become familiar with standard types of models, identify the applicable model type, and in selected cases apply computerized software for the solution of his/her formalized problems. Second, the course seeks to provide the student with guided mathematical/statistical project experience.

The following course outcomes provide specifics regarding the course objectives.

COURSE LEARNING OUTCOMES[1]

As a result of your study you should be able to:

	Course L0	Program LO	Institutional LO	Assessment Activity
1.	Solidify the student's prerequisites in algebra, geometry, statistics and elements of computer science as applied to Quantitative Methods in Business and Financial Management.	PLO 4	ILO 1c, ILO 5c.	Homework: problems and, cases
2.	Model realistic phenomena while paying attention to model's assumptions and borders.	PLO 1	ILO 1c, ILO 5c.	
3.	Formally and precisely express ideas with the aid of notations, symbols and formulae as they apply to structured set-ups and solutions.	PLO 2	ILO 1c, ILO 2c, ILO 6c.	
4.	Solve complex problems by their breakdown to several ordered sub problems in a hierarchical manner.	PLO 4	ILO 1c, ILO 5c.	
		PLO 6	ILO 4c, ILO 5c.	
5.	Demonstrate his/her comprehension of the			

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[1] Detailed description of learning outcomes and information about the assessment procedure are available at the Center for Teaching and Learning website (ctl.lincolnuca.edu).

	necessary in problem setups and in the structure of algorithms for problem solutions.			
6.	Interpret results of quantitative models.			
7.	Demonstrate working knowledge of sensitivity analysis.			
8.	Use linear programming as a flexible optimization tool, and apply the EXCEL software for its application.			
9.	Compare Inventory models.			
10.	Set up project activity network, and determine the critical path and optimal scheduling.	PLO 1 PLO 4 PLO 6	ILO 1c, ILO 5c. ILO 1c, ILO 5c. ILO 4c, ILO 5c.	
11.	Conduct an Operations Research based project which may be of applied nature or a theoretical contribution.	PLO 1 PLO 2 PLO 4 PLO 6	ILO 1c, ILO 5c. ILO 1c, ILO 2c, ILO 6c. ILO 1c, ILO 5c. ILO 4c, ILO 5c.	Homework: problems and, cases. Project assignments, written report and presentation

METHODOLOGY

The teaching will be done mostly by lecture and exercise mode. Projects typically require the application of special methodologies, based on literature review and guided exposure. (See in the Examination a special section regarding project requirements.) The students will achieve comprehension of the topics through routine individual problem set ups and solving. The professor's requirements for set ups and solutions are often more stringent than those in the textbook. Thus, the course requirements supersede the textbook's requirements. The HW is individually and group supervised to assure turning of complete HW. We are using the CANVAS software for HW collection, submission time monitoring and grade assignments. The HW files are submitted for grade only through CANVAS and only in a doc. Format. Only submission of typed answers would be considered, with following exception for graphs. Graphs may be done either using computer software, or by hand on a graph paper. If the graphs are done by hand, they must be scanned, and the scanning done by a scanner prior to submission to make them clearly legible. Graphs must be highly legible to be considered admissible. In addition, every student must bring the hard copy of the submitted HW for inspection at the beginning of the class and use it to pass over the solutions or to present the student's solution to the rest of the class. Failing to do so may result in lower HW credit. Every student must be listed with CANVAS. An added student must belong to a group and inform the teaching assistant his/her added status and group number. HW is due by 1AM Tuesday or Thursday, as instructed by

CANVAS. If you are late, you still may use an automatic extension of 8 hours and submit the HW by 9 AM of that date, through CANVAS. CANVAS has a built in time cut off function and will not allow submission past the deadline or the deadline extension. No further extension will be provided. Hence, any homework past the due date extension deadline will not be accepted for grading.

In reporting to CANVAS every student must list on his/her assignment by the following order, the following information: Student ID, Last Name and First Name - as appear on the enrolment sheet and group number.

The problems will be assigned from the textbook as well as from the recommended supporting sources. Students may be called to the board to demonstrate and explain their solutions. The textbook will be used as a handbook. It must be brought to class, whenever its topics are studied.

Students should be aware that past experience indicates that the overall effect of HW performance on the grade is on average about 70 to 80 percent, even though the direct contribution of the HW to grade as computed is only 10%. There will be weekly exercise session where the Teaching Assistant will go over the solutions to the given problems and help understanding most recently taught material. Attendance will be taken at these sessions.

Students joining the class late due to administrative delays must attend special lectures during the office hours in order to catch up with the material and not delay the rest of the class. Failure to do so may result in/or non-admission to the class and course failure.

Additional Material Requirements:

A simple calculator without <u>any</u> second function but with a square root function. Memory storage and recall functions are allowed. Possession of the textbook and of the simple calculator is required in every class meeting.

Assignments and projects require students to actively use resources of the library. Detailed guide to business *resources of the library* as well as the description of Lincoln University approach to *information literacy* are available at the Center for Teaching and Learning website (ctl.lincolnuca.edu).

Student Conduct:

- ➢ Please participate. What you put into the class will determine what you get out of it – and what others get out of it.
- ➢ Please come **on time.** Late arrivals disturb everyone else. Plan to stay during the whole class period. Attendance may be taken at least one time in of each class. In the case where more than one attendance is taken, <u>only students attending all attendances would be considered as present</u>. Attendance is a component of the overall grading.
- ➢ Students may not read other materials (newspapers, magazines) during class and no multitasking is allowed.
- ➢ Students are not allowed to come and go during class sessions.
- ➢ If you miss a class, you are responsible for getting notes/slide printouts on the material covered from a classmate in your group.
- ➢ To avoid distracting noise in class, cellular phones **must** be turned off or the ringing mode silenced.

➢ During an exam or a review of an exam all recording devices of any form must be closed and stored in closed bags. (See also Examination Policy).

➢ All class participants are expected to exhibit respectful behaviors to other students and the instructor. All students have the right and privilege to learn in the class, free from harassment and disruption. Inappropriate or disruptive behavior will not be tolerated, nor will lewd or foul language.

EXAMINATION POLICY

The exams are closed books exams. I will use exams with mixed format. One part of every exam is objective, consisting of TF and MC questions. The student should be aware that questions in this part often require problem solving and/ or involve challenging conceptual questions. It is thus as challenging as the second part. The second part (with larger weight in the exam) is comprised of problems which require students' written answers. No breaks are allowed during the midterm or the final. (I will make alternative testing opportunities where the need for break is medically required and professionally supported by a letter from a medical doctor.).

The student is required to bring an approved simple calculator to the exams. No exchange of pencils, pens, erasers and any other material between students is allowed. No electronic instrument capable of copying material in any form (in particular, in print or visual image) is allowed in the exam or during a review of an exam. In particular, cell phones, organizers, advanced calculators, tape recorders, cameras, computers, etc. must be closed and stored inside a closed bag. Students violating these requirements should expect an F, as well as further disciplinary hearing.

INDIVIDUAL RESEARCH PROJECT (1 unit)

Each student registered for a 400-level course must complete a one unit research project in addition to the coursework described in this syllabus. The specific topic will be assigned by the instructor.

The project requires 45 hours of self-study with regular consultations in accordance with the schedule determined by the instructor. The project work results in a written report (not less than 15 pages; APA style) and an oral presentation during the class session.

Evaluation of the student's work will be done using the following rubric:

WRITTEN REPORT				
	Exceeds Standards	*Meets Standards*	*Does Not Meet Standards*	*Not Present*
Research Problem Statement	The statement of a research problem is crystal clear, novel and thought provoking	Clearly and concisely identifies a research problem	The statement of a research problem is incomplete, lacking precision.	The statement of a research problem is absent.
Organization	The report is logically organized; ideas are exceptionally	The development of ideas is present; the	Organization is confusing, disjointed, and inconsistent; ideas, if present, are	The report lacks organization

	well-developed and support a thoughtful and engaging conclusion.	conclusion is effective and directly addresses the original thesis.	not developed; the conclusion is vague and/or does not address the original thesis.	
Sources and formatting	A variety of high-quality sources is used; all factual claims are supported with citations. The report follows the APA style guidelines.	A few high-quality sources are used; majority of factual claims are supported with citations The report mostly follows the APA style guidelines.	Sources used are of a questionable quality; factual claims are not supported. Use of APA style is inconsistent.	Sources are not identified or of a poor quality; factual claims are unsubstantiated. The report is poorly formatted

PRESENTATION			
	Exceeds Standards	*Meets Standards*	*Does Not Meet Standards*
Style and Organization	Presentation is clear, confident and fully engaging; the use of visual aids enhances its effectiveness; the presentation is well-timed and structured.	Presentation is clear; the use of visual aids is not detrimental to audience engagement; all necessary components are given appropriate time.	Presentation lacks clarity, no attempt is made to engage the audience; visual aids are haphazard and distracting; lack of structure results in an inefficient use of time.
Questions and Answers	Student demonstrates extensive knowledge of the topic by providing confident, precise and appropriate responses to all audience question.	Student demonstrates knowledge of the topic by responding adequately to questions of the audience.	Student demonstrates lack of knowledge of the topic by responding inaccurately and inappropriately to audience questions.

GRADING GUIDELINES

Class participation and attendance 10 pts
Homework and assignments 10 pts
Midterm 30 pts
Final 50 pts
Project 35*
Total course points: 135 pts.
*Project grades are based in part on special project assignments.

The grade will be based on a curve, reflecting the standards of Lincoln University. The following table details the satisfactory cut points for the grade, and the corresponding grade.

Course Points	Grade
115 and above	A
110-114	A-
105-109	B+
100-104	B
88-99	B-
80-87	C+
78-79	C
71-77	C-
68-70	D+
64-67	D
Below 64	F

To gain a passing grade, a student must substantially participate in every course component. In particular the student must substantially participate in the HW.; this regardless of the student's exams' grade. Similarly, the student must participate in both exams, and in the project to receive a passing grade.

COURSE SCHEDULE

We will focus on elements in the following chapters^, in Anderson et al. and in Lapin and Whisler:

Dates: Topic ^^   Chapters^

1/21-1/23 *Introduction and Quantitative tools* (Chs. A 1, 2; L 8)

1/21-2/11 *Linear Programming I (Graphical Solution)* (Chs. A 1, 2; L 8)

2/4-2/20   *Linear Programming II (Multivariate and Computer Solutions)* (Chs. A 3, 4, 5; L 9)

2/18   *Midterm*

2/20-3/3   *Inventory Models* (Chs. A10; L 15 and elements of L 16)

2/25-3/5   *Project Management with PERT and CPM* (Chs. A 9; L 14)

3/17   *Final*

^The references are to chapters^, in textbooks of Anderson et al. and Lapin and Whisler.

^^This is not an exclusive list of topics to be covered in this course. If time permits, I will accelerate the presentation. Alternatively, if necessary, pace and intensity of coverage may be traded off to assure greater comprehension.

Special Dates:
Presidents Day Holiday: February 17.
Midterm: February 18.
Spring Recess March 10-14.
Final: March 17.
Sched. Mathematical and Statistical Software for Modeling and Analysis.   Flex.

Updated: January 12, 2020. The syllabus may be updated in the future as necessary. Expect possible changes, and follow announcements regarding them on CANVAS.