Lincoln University

BA 460 – Quantitative Methods for Business and Finance Management

COURSE SYLLABUS
Spring 2021

Instructor:	Prof. Aharon Hibshoosh, Ph.D.
Lecture Schedule:	Monday, 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:	Monday, 21:15 – 23:15
	Phone: (510) 712 4410
Textbooks:	David R. Anderson (Author), Dennis J. Sweeney (Author), Thomas A. Williams (Author), Jeffrey D. Camm (Author), James J. Cochran (Author) (2019) *Management Science: Quantitative Approach, 15th ed.*, ISBN-13: 978-1337406529 ISBN-10: 133740652X, 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-10: 0-534-38024-7).
Last Revision:	January 28, 2021

COURSE 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 models, forecasting, transportation, and assignment models, Markov analysis, 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

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 PLO 2	ILO 1c, ILO 5c. ILO 1c, ILO 2c, ILO 6c.	
3.	Formally and precisely express ideas with the aid of notations, symbols and formulae as they apply to structured set-ups and solutions.	PLO 4 PLO 6	ILO 1c, ILO 5c. ILO 4c, ILO 5c.	
4.	Solve complex problems by their breakdown to several ordered sub problems in a hierarchical manner.			

[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).

5.	Demonstrate his/her comprehension of the 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.	Learn to formulate and operate variety Transportation, Assignment, and Transshipment problems.			
10.	Become familiar with a variety of concepts, criteria and techniques used in Decision Making and apply them.	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. The course follows textbook topics and the routinely the textbooks and other handout material would be used as handbooks. Hence, the student must have them ready and opened in every meeting which is not an exam meeting. 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.

Students will be graded based on both their HW submission and their required oral presentation of these answers during class meetings. 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 professor of his/her added status and group number. Group size will be limited. Group switching is not allowed, except under extenuating circumstances and subject to instructor approval. HW is due by 1AM Monday, 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. In the case of group assignments only students who participated in the group assignment should be listed and gain credit. The credit is identical to and only to those who participated. The group must review the group's questions and answers together before its submission and set a deadline to acceptance of any individual student's contributions before the final joint meeting. The group assignments should be turned in only by the group leader. The turned in assignment is to start by listing the group number and the participants in that assignment. Only one submission of assignment per group is allowed.

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 an optional weekly exercise session where the I will go over the solutions to the given problems and help understanding most recently taught material.

Students joining the class late 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. They are not entitled to turn in any assignment whose deadline passed. Hence, enter the class and attend it as soon as you can.

Assignments and projects may 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 to the session **on time.** Late arrivals disturb everyone else. Plan to stay during the whole class session period. Attendance may be taken at least one time in each class. In the case where more than one attendance is taken, only students attending all attendances would be considered as present. Attendance is a component of the overall grading.
- Students computer cameras must be opened throughout the meeting.
- 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 on the material covered from a classmate in your group.
- 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

Facing the Covid-19 Pandemic, it is not clear at this point in time, whether it will be possible to administer in school exam(s) or to have the exam(s) online. Hence, this section of the syllabus may be updated. Announcements regarding updates would be sent via Canvas. The exams are closed books exams. In case of an online exam, for greater validity, the student may be expected to explain his/ her answers orally in a special meeting.

The exams are comprised of questions and problems which require students' written answers, plotting of diagrams, and answering objective questions (MC). 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. This calculator should have the four arithmetic operations and square root, but no second functions.

The exams are not comprehensive. The midterm will only include the chapters and other topics covered in the lecture prior to the midterm, as well as associated extra lecture information. The final will similarly include the material and topics not covered by the midterm.

The exams are timed and will be automatically closed. No credit is received for any answer not submitted on time. This regardless of the reason for which the answer was not received. Hence, a hardware or software failure, unless universal and thus applying to every student in the class, would not result in any individual credit adjustment. So please make sure that you do not face any such problem. The proper interface with the exam is entirely considered a student responsibility.

The exams are strictly individual ones. In case of online exams, the student must take them alone in a closed room. The exam would begin by checking the student surrounding. Any communication by any means, with anyone except the exams' supervisors is not allowed. The student camera must be opened and available for showing the full closed room with the individually examined student. A student whose camera is not operative is not allowed to participate in the exam. A student whose camera stopped operating is considered as someone who finished the exam. Unlawful participation regardless of its reason, technical or otherwise would

automatically result in an F grade. The individual participation in the exam would be supervised throughout the exams, so dress properly and be ready to individually modify your interface environment according to the supervisors' comments.

Any conduct that constitutes subversion of the exam is punishable in at least a course failure. These specifically include: copying, removing or reproducing examination material; communication with anyone with the purpose of reconstructing the examination or any part of it; keeping or using the instructor's past exam questions to prepare for the exam without specific instructor authorization; distributing any examination material; impersonating an examinee or having an impersonator take the examination. This list is not exhaustive. No equipment capable of communication or allowing copying of the exam's question is allowed. In particular, no phones are allowed in the student's examination room.

Online exams must be taken by using computers, and no other devise is allowed. The computer is needed for both participating in the meeting and exam control on one hand, and access to Canvas on the second hand. Beyond that no Internet Use is allowed. In particular, no search on the Internet for any course term is allowed. An exam question may have a link to an entry in the Internet (due to software link on Google) , but this link should not be followed.

During the exam no communication with other 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. In particular, cell phones, organizers, computer, calculators, tape recorders cameras, computers, etc. must be closed and stored inside a closed bag. Only a simple calculator, without second functions as described above is allowed and required. Likewise, any conduct that constitutes subversion of the exam is punishable in at least a course failure. These specifically include: removing or reproducing examination material; communication with anyone with the purpose of reconstructing the examination or any part of it; keeping or using the instructor's past exam questions to prepare for the exam without specific instructor authorization; distributing any examination material; impersonating an examinee or having an impersonator take the examination. This list is not exhaustive.

A student violating any of these requirements or similar ones should expect an F, in addition to other disciplinary consequences.

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

Topics^ and Tentative Schedule^^

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

Dates:	**Topic**	**Chapters^**
2/1-2/8	*Introduction and Quantitative tools*	(Chs. A 1, 2; L 8)
2/8-3/8	*Linear Programming I (Graphical Solution)*	(Chs. A 1, 2; L 8)
3/8-3/22	*Linear Programming II (Multivariate and Computer Solutions)*	(Chs. A 3, 4, 5; L 9)
3/29	*Midterm* ***Passover***	
4/5-4/12	*Transportation, Assignment, and Transshipment problems*	(Chs. A 7; L 12)
4/19-5/3	*Decision Making*	(Chs. A 14; L 5, L6)
5/10	*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 15.
Midterm: March 29
Final: May 10
Flex. Sched. Mathematical and Statistical Software for Modeling and Analysis.

Updated: January 22, 2021. The syllabus may be updated in the future as necessary. Expect possible changes, and follow announcements regarding them on CANVAS.

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 well-developed and support a thoughtful and engaging conclusion.	The development of ideas is present; the conclusion is effective and directly addresses the original thesis.	Organization is confusing, disjointed, and inconsistent; ideas, if present, are not developed; the conclusion is vague and/or does not address the original thesis.	The report lacks organization
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.