



Lincoln University

Course Title: Finite Mathematics	Instructor: Prof. S. M. Goberstein
Course No: MATH 15	Phone: 510-628-8037
Units: 3 units (45 lecture hrs.)	E-mail: goberstein@lincolnuca.edu
Level: Introductory (I)	Office Hours: 11:45 – 12:15 by appointment
Class Hours: Wednesday, 9:00 – 11:45 am	Office number: Room 407
Semester: Spring 2018	

REQUIRED MATERIALS

Textbook: *Finite Mathematics*, 7th edition, by Howard L. Rolf, Brooks/Cole, 2011,
ISBN-13: 978-0-538-49732-9, ISBN-10: 0-538-49732-7

Required Tools: A scientific or graphing calculator.

COURSE DESCRIPTION

Topics include matrix theory, linear systems, linear programming, probability, decision theory, and game theory. Also applied calculus is covered. (3 units)

LEARNING OBJECTIVES

Students will review basic algebra and elementary properties of functions, learn basic concepts and techniques of mathematics of finance, linear algebra, linear programming, probability theory, and statistics (and practice how to apply them). The goal is to build a solid foundation in the principles of mathematical thinking.

INSTRUCTIONAL METHODS

This is a direct classroom instruction course.

Lecture method is used in combination with the practical use of a calculator, business software, and the Internet resources to solve application problems. Homework assignments will be given weekly throughout the course.

OTHER REQUIREMENTS

Students are expected to attend all class sessions. Use of mobile devices, laptops, or textbooks during exams is not allowed. Plagiarism/cheating on the exams will result in failing the course and a report to the administration.

ASSIGNMENTS, QUIZZES, and TESTS

Homework assignments will be due at the beginning of the class on the following dates: **Jan. 24, Feb. 14; March 28; April 11.** Quizzes (see the schedule below) will be based on the preceding homework assignments, will be given at the beginning of the class session (after answering questions) and will last 20 minutes. The midterm test will be for 75 minutes and the final for 2 hours. The tests will be given at the end of the respective class session (the first part of that class will be devoted to answering questions).

EXAM SCHEDULE:

There will be 4 quizzes (each will be “worth” 30 points), 1 midterm test (150 points), and a comprehensive Final Test (200 points). The exam schedule is as follows:

Quizzes:	February 7, 21; April 4, 18
Test 1:	March 7
Final Test:	May 2

GRADING POLICY:

The total score for homework assignments will be 30 points. Denote by HQ the sum of your homework and quiz scores, by MT your midterm test score, and by FT your final test score. The smallest one of the three numbers – HQ, MT, and $(3/4)FT$, will be discarded. Let S denote the sum of the **remaining** two numbers, and let $P = (S+FT)/5$. Your performance in class will be measured as P%, and the course grade will be assigned according to the following scheme:

93 – 100 % A	81 – 82 % B-	63 – 65 % D+
91 – 92 % A-	78 – 80 % C+	51 – 62 % D
89 – 90 % B+	69 – 77 % C	0 – 50 % F
83 – 88 % B	66 – 68 % C-	

Session	Date	Topics	Book Sections
1	01/17	Review of Basic Algebra Topics	A1 – A4
2	01/24 HW is due	Linear Functions and Graphs. Linear Equations. Systems of Two Linear Equations	1.1 – 1.3, 2.1
3	01/31	General Systems of Linear Equations. Matrix Representation of Linear Systems. Gauss-Jordan Method	2.1 – 2.3
4	02/07 Quiz 1	Matrices. Basic Matrix Operations. Multiplication of Matrices. The Inverse of a Matrix	2.4 – 2.6
5	02/14 HW is due	Linear Inequalities in Two Variables. Solutions of Systems of Linear Inequalities. Linear Programming: A Geometric Approach	3.1 – 3.3
6	02/21 Quiz 2	The Simplex Method: Standard Maximization Problem	4.1 – 4.2
7	02/28 HW is due	The Simplex Method: Standard Minimization Problem, Duality	4.3 – 4.4
8	03/07	Test 1	All sections listed above
9	03/21	Mathematics of Finance	5.1 – 5.4
10	03/28 HW is due	Sets. Counting Elements in Subsets of a Set. Basic Counting Principles	6.1 – 6.3
11	04/04 Quiz 3	Permutations and Combinations. A Mixture of Counting Problems	6.4 – 6.6
12	04/11 HW is due	Basic Probability Notions. Compound Events. Conditional Probability. Independent Events	7.1 – 7.5
13	04/18 Quiz 4	Bayes' Rule. Frequency Distributions. Measures of Central Tendency. Measures of Dispersion	7.6, 8.1 – 8.3
14	04/25	Random Variables. Expected Value of a Random Variable. Binomial and Normal Distributions	8.4 – 8.7
15	05/02	Final Test	Comprehensive

Appendix A. Course Learning Outcomes

	Course LO	Program LO	Assessment
1	Employ analytical techniques and tools to create valid information in support of decision-making	PLO 1	Simulation management game, Case study, Classroom exercise
2	Formulate and implement strategic responses to change in external and internal environment	PLO 2	Simulation management game, Case study, Classroom exercise
3	Be able to identify and formulate a strategy of obtaining competencies, capabilities, and resources required for the implementation of business strategy	PLO 4	Simulation management game, Case study, Classroom exercise
4	Define corporate development objectives that allow to achieve and sustain competitive advantage	PLO 5	Simulation management game, Case study, Classroom exercise

Appendix B. Program and Institution Learning Outcomes.

Institutional Learning Outcomes (ILOs)	
<i>Graduates of the BA program of Lincoln University should be able to:</i>	
1a	Develop the habits and skills necessary for processing information based on intellectual commitment, and using these skills to guide behavior.
2a	Raise important questions and problems, and formulate them clearly and precisely in oral or written communication
3a	Act with dignity and follow the principles concerning the quality of life of all people, recognizing an obligation to protect fundamental human rights and to respect the diversity of all cultures.
4a	Focus on individual and organizational benefits; communicate to co-workers and company’s leadership in facilitation of collaborative environment; to be honest and transparent with regard to their work, and to be respectful of the work of others.
5a	Display sincerity and integrity in all their actions, which should be based on reason and moral principles; to inspire others by showing mental and spiritual endurance
6a	Show creativity by thinking of new and better goals, ideas, and solutions to problems; to be resourceful problem solvers.
7a	Define and explain the boundaries, divisions, styles and practices of the field, and define and properly use the principal terms in the field

Program Level Outcomes (PLOs)	
<i>Students completing General Education courses in BA program will be able to:</i>	
1	Demonstrate proficiency in college-level mathematics, English, sciences, humanities, and social sciences.
2	Represent mathematical information symbolically, visually, numerically, and verbally. Being able to interpret and apply arithmetical, algebraic, and geometric methods to solve problems.
3	Communicate effectively in multiple creative and academic writing genres by applying Standard American English.
4	Think critically and apply common sense in approaching and solving real-world problems.
5	Demonstrate proficiency in skills that sustain lifelong learning, particularly to think critically and responsibly in assessing, evaluating, and integrating information.
6	Understand the responsibilities of active citizenship, community engagement, and social responsibility.

Institutional Learning Outcomes (ILOs)	
<i>Graduates of the BS program of Lincoln University should be able to:</i>	
1a	Develop the habits and skills necessary for processing information based on intellectual commitment, and using these skills to guide behavior.
2a	Raise important questions and problems, and formulate them clearly and precisely in oral or written communication
3a	Act with dignity and follow the principles concerning the quality of life of all people, recognizing an obligation to protect fundamental human rights and to respect the diversity of all cultures.
4a	Focus on individual and organizational benefits; communicate to co-workers and company’s leadership in facilitation of collaborative environment; to be honest and transparent with regard to their work, and to be respectful of the work of others.
5a	Display sincerity and integrity in all their actions, which should be based on reason and moral principles; to inspire others by showing mental and spiritual endurance
6a	Show creativity by thinking of new and better goals, ideas, and solutions to problems; to be resourceful problem solvers.
7a	Define and explain the boundaries, divisions, styles and practices of the field, and define and properly use the principal terms in the field

Program Level Outcomes (PLOs)	
<i>Students completing General Education courses in BS program will be able to:</i>	
1	Demonstrate proficiency in college-level mathematics, English, sciences, humanities, and social sciences.
2	Being able to interpret and apply arithmetical, algebraic, and statistical methods to solve problems
3	Communicate effectively in diagnostic field by applying Standard American English. Be able to use appropriate terminology accepted in DI field.
4	Think critically and apply common sense in approaching and solving DI and real-world problems.
5	Demonstrate proficiency in skills that sustain lifelong learning, particularly to think critically and responsibly. Be able to evaluate and integrate DI information.
6	Understand the responsibilities of active citizenship, community engagement, and social responsibility.
7	Develop basic understanding of bioethics’ standards acceptable in the field of diagnostic imaging.

Appendix C. Classification of Courses

Code	Classification	Description
Courses < 10, and 300A/300B	Review (R)	Review courses are supplemental courses that are not a part of any program.
Courses 10 - 99	Introductory (I)	Introductory undergraduate courses are designed to acquaint students with foundational concepts, ideas, and competences in a specific field of study as well as general education disciplines. General Education courses provide a background in the liberal arts and expose students to the fundamental aspects of human culture. They also help students to develop analytical and communication skills and foundation for advanced work in the major field of study.
Courses 100 - 199	Developed (D)	Developed undergraduate courses build upon the concepts, ideas, and competences introduced in the Introductory level; expanding students' understanding of the specific field of study.
Courses 200 - 286	Advanced (A)	Advanced courses in undergraduate programs are intended to bring students' comprehensive knowledge of concepts, ideas, and skills in the specific field of study to the highest level within the baccalaureate programs.
Courses 288 - 299	Bachelor Assessment (BA)	Bachelor Assessment courses are structured to provide opportunity to assess students' achievements of set program learning outcomes.