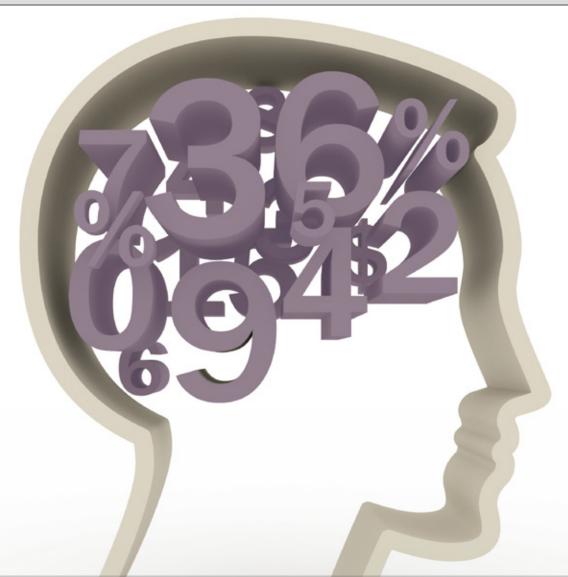


MBA Foundation



QUANTITATIVE ANALYSIS (BUSx903) EXAM PREPARATION GUIDE

www.excelsior.edu



Introduction

The MBA Foundation Examinations measure knowledge and understanding of material covered in Excelsior College's MBA program's five foundational courses, namely—Quantitative Analysis (BUS 503), Finance (BUS 505), Marketing (BUS 506), Organizational Behavior (BUS 553), and Ethics (BUS 523). Students in the MBA program can choose to test out of one or more of these courses by receiving a passing grade (70%) for each exam. If a student passes the exam, the corresponding course requirement is waived; however, no credits will be awarded.

Quantitative Analysis (BUS 503) is a basic analytical course required in the Excelsior MBA program. The assessment is designed to measure the basic knowledge and understanding achieved by working adults in the area of Quantitative Analysis. Students who have successfully completed an undergraduate course in Quantitative Analysis with a grade of B or better in the last ten years will not need to take the exam.

The intent of this guide is to provide information on the topics and the reference (textbook) for the exam to students who are planning to take the foundation exam. In addition, the guide includes some sample questions for students to review.

Important information to help you prepare for this MBA Foundation® Examination

General Description of the Exam

The exam is designed to assess the major quantitative techniques required for successful performance in the graduate level quantitative courses (e.g., Statistics, Finance, Economics, etc.)

Learning Outcomes:

The exam objectives support the achievement of the following program learning outcomes:

- 1. Describe the role of quantitative methods in business decision making.
- 2. Compare and contrast different business modeling techniques.
- 3. Develop solutions for business problems using the following quantitative techniques:
 - Decision Analysis
 - Queuing
 - Simulation
 - Linear Programming
 - Network Models, including Transportation, Transshipment, and Assignment
 - Project Management
- 4. Describe ethical aspects of quantitative analysis.
- 5. Describe the relevance of aspects of quantitative analysis to the global business environment.

Uses for the Examination

The School of Business and Technology in Excelsior College recommends that students who receive a passing grade on this examination receive a waiver for the appropriate graduate-level course on Quantitative Analysis (BUS 503).

Exam Length and Scoring

- The exam consists of 100 four-option multiple choice questions.
- The time limit of the exam is two hours.
- This is a non-credit bearing exam.
- Passing grade cut point is 70%.
- Students will be awarded the grade of "Pass" or "Fail."
- Students will only be able to take this specific exam once.

Exam Construction and Validity

Excelsior College assessment experts subject each question to rigorous tests of sensitivity and reliability.In addition, every effort is made to include questions that assess the most common and important topics and skills within the College's current course. A committee of teaching faculty and practicing professionals determine the learning outcomes to be tested. Working with the School of Business and Technology, the Excelsior College Assessment Unit staff oversees the technical aspects of test construction in accordance with current professional standards. To promote fairness in testing, we take special care to ensure that the language used in the exams and related materials is consistent, professional, and user friendly. Editorial staff perform systematic quantitative and qualitative reviews that address accuracy, clarity, and compliance with conventions of bias-free language usage.

Exam Administration

The exam is administered at Pearson VUE testing centers worldwide. All questions regarding the administration of this exam should be directed to the Test Administration Office at Excelsior College. Students must receive prior approval from their advisors before they can register to take the exam (www.excelsior.edu/messagecenter).

Computer-Delivered Testing

The exam will be delivered by computer at the Pearson VUE Testing Center. You will enter your answers on the computer using either the keyboard or the mouse. The system used for our computer-delivered testing is designed to be as user-friendly as possible, even for those with little or no computer experience.

We strongly encourage you to use the online tutorial prior to taking your exam at Pearson Professional Centers. If you wish to access the tutorial, go to www.excelsior.edu/exams and click on the ECE Virtual Tour. A tutorial will not be available at the test center.

Suggestions for Test Preparation

At the core of each exam preparation guide is a detailed content outline that begins with a content/percent chart showing the relative importance of each major content area to be assessed. These weightings may be useful to you as you are preparing the review of this MBA foundation exam. You may want to review the content areas in the outline and the corresponding sections in the required textbook from the course. It is not required that you purchase a copy of the textbook. However, exam questions are based on the materials taught in the course and included in the textbook.

For each exam, five sample questions are provided to illustrate those typically found on the particular exam. The sample questions are not intended to be a practice test, but they may serve as models if you wish to create your own test questions for review purposes.

In the last pages of this guide, you will find rationales for the multiple-choice sample questions. The key (correct answer) is indicated in **bold**.

The rationales explain why the key is the correct answer and what is wrong with the other answer choices. In addition, each question is referenced to the content outline. Please note that if you chose one of the wrong answers, you should return to its section of the content outline for additional review.

On the day of your exam, do yourself some favors:

- Arrive at the test site rested and prepared to concentrate for an extended period.
- Be sure to allow sufficient time to travel, park, and locate the test center.
- Practice healthy eating and stress control in the days before your exam.
- Dress comfortably—the computer will not mind that you are wearing your favorite relaxation outfit.
- Be prepared for possible variations in temperature at the test center due to changes in the weather or energy conservation measures.
- Bring your IDs and ATT letter, but otherwise, do not weigh yourself down with belongings that will have to be kept in a locker during the test.

Academic Honesty Nondisclosure Statement

All test takers must agree to abide by the terms of the Excelsior College Academic Honesty Policy before taking an examination. The agreement will be presented on screen before the start of your exam. Once you accept the terms of the agreement, you will be able to proceed with your exam. If you choose not to accept the terms of this agreement, your exam will be terminated. You will not be eligible for a refund. For more information, review the Student Policy Handbook at www.excelsior.edu/studentpolicyhandbook.

Student behavior will continue to be monitored post administration and electronic measures are used to monitor the security of test items and scan for illegal use of intellectual property. This monitoring includes surveillance of Internet chat rooms, Web sites, and other public forums.

Content Outline

The major content areas on the MBA Quantitative Analysis examination and the percent of the examination devoted to each content area are listed below.

Content Area			Percent of the Examination
I.	Decision Making Overview		5%
II.	Decision Analysis		15%
III.	Queuing Theory		10%
IV.	Risk Analysis		5%
V.	Linear Programming		15%
VI.	Sensitivity Analysis		15%
VII.	Linear Programming Applications		15%
VIII.	Distributions and Network Models		10%
IX.	Integer Programming		5%
Χ.	Project Scheduling		5%
		Total:	100%

I. Decision Making Overview (5%)

- A. Decision Making Process
- B. Model Development
 - 1) Model Types
 - 2) Mathematical Modeling

II. Decision Analysis (15%)

- A. Decision Making without Probabilities
 - 1) Optimistic Approach
 - 2) Conservative Approach
 - 3) Minimax Regret Approach
- B. Decision Making with Probabilities
 - 1) Decision Trees
 - 2) Expected Values
 - 3) Expected Value of Perfect Information
 - 4) Risk Analysis
- C. Decision Making with Sample Information
 - 1) Decision Strategy
 - 2) Bayes' Theorem
 - 3) Expected Value of Sample Information

III. Queuing Theory (10%)

- A. Waiting Line Structure
 - 1) Single Channel
 - 2) Arrival Processes (Poisson distribution)
 - 3) Services Processes (exponential distribution)
 - 4) Queue Discipline
- B. Single Channel with Poisson Arrival and Exponential Service (M/M/1)
- C. Multiple Channel with Poisson Arrival and Exponential Service (M/M/2)
- D. Economic Analysis of Waiting Lines

IV. Risk Analysis (5%)

- A. Applications of Monte Carlo Simulation
 - 1) Risk Analysis
 - 2) Inventory Models
 - 3) Waiting Line Models

V. Linear Programming (15%)

- A. Simple LP Formulation
 - 1) Problem Formulation (maximization/minimization)
 - 2) Graphical Solution
 - 3) Extreme Points
 - 4) Interpretation of Computer Output
 - 5) Special Cases

VI. Sensitivity Analysis (15%)

- A. Graphical
 - 1) Objective Function
 - 2) Right Hand Sides
- B. Computer Output
 - 1) Dual Price
 - 2) Reduced Cost
 - 3) Range of Feasibility
 - 4) Simultaneous Changes

VII. Linear Programming Applications (15%)

- A. Marketing Applications
 - 1) Media Selection
 - 2) Marketing Research
- B. Financial Applications
 - 1) Portfolio Selection
 - 2) Financial Planning
- C. Operations Management Applications
 - 1) Make vs. Buy
 - 2) Production Scheduling
 - 3) Workforce Assignment

VIII. Distribution and Network Models (10%)

- A. Transportation Problem
- B. Assignment Problem
- C. Transshipment Problem

IX. Integer Programming (5%)

- A. Graphical Solution
- B. Computer Solution
- C. Applications
 - 1) Capital Budgeting
 - 2) Fixed Costs
 - 3) Distribution Systems

X. Project Scheduling (5%)

- A. Projects with Known Activity Times
 - 1) Critical Path Concepts
 - 2) Determining Critical Path
- B. Projects with Uncertain Activity Times

Sample Questions

The questions that follow illustrate those typically found on this exam. Answer rationales can be found on page 8 of this guide.

- 1. What is the volume that results in revenue being equal to total cost?
 - A. profit-volume model
 - B. break-even point
 - C. marginal volume
 - D. marginal cost
- In a waiting line situation, arrivals occur at a rate of 2 customers per minute, and the service times average 20 seconds per customer. Assume the Poisson and exponential distributions.

What is the average time (in minutes) a customer spends in the waiting line?

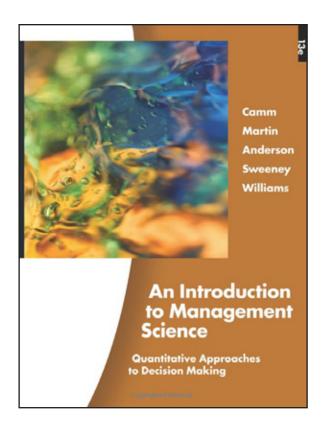
- A. 0.25
- B. 0.50
- C. 2.00
- D. 4.00
- 3. Which term describes the process of determining if the computer procedure that performs the simulation calculations is logically correct?
 - A. implementation
 - B. repetition
 - C. validation
 - D. verification

- 4. If the acceptance of project A is conditional on the acceptance of project B, and vice versa, what is the appropriate constraint to use?
 - A. multiple-choice
 - B. corequisite constraint
 - C. k-out-of-n alternatives
 - D. mutually exclusive constraint
- 5. Activities K, M, and S immediately follow activity H, and their latest start times are 14, 18, and 11. What is the latest finish time for activity H?
 - A. 11
 - B. 14
 - C. 18
 - D. It cannot be determined.

Learning Resources for this Exam

The textbook listed below is recommended by Excelsior College and is the textbook used for the graduate course in Quantitative Analysis (BUS 503). For information on ordering from the Excelsior College Bookstore, please see page 10 in this guide. You may also find resource materials in other college libraries or bookstores. Public libraries may also have the textbook or may be able to obtain it through an interlibrary loan program.

Recommended Textbook



Introduction to Management Science with CD			
Author	Anderson, David R./ Sweeney, Dennis J.		
Edition	13th Edition		
ISBN-10	1-439-04327-2		
ISBN-13	978-1-439-04327-1		
Publisher	South-Western Publishing Co.		

Order the resources you need today!

The Excelsior College Bookstore is available by phone, fax, email, Web site, and mail.

See page 10 for ordering information.

Rationales for Sample Questions

- 1. [IB1] Decision Making Overview Model Development Model Types
 - A. The profit-volume model determines the total profit associated with a specified productionsales volume.
 - B. Break even analysis determines the sales level needed to break even or when cost or expenses and revenue are equal. There is no net loss or gain.*
 - C. There is no such thing as "Marginal Volume". Marginal cost varies directly with production volume. In general, if the volume of output increases, the cost per unit decreases.
 - D. Marginal cost is the total cost which results from producing one additional unit.

- 2. [IIIB] Queuing Theory Single Channel with Poisson Arrival and Exponential Service (M/M/1)
 - A. In a single-channel waiting line model with Poisson arrivals and exponential service times, the average time a customer spends in the waiting line is W_q , the average number of customers in the waiting line is L_q , the mean number arrivals per time period is λ , and the mean number of services per time period is μ .*

$$\begin{split} W_{\mathbf{q}} &= \frac{L_{\mathbf{q}}}{\lambda} \\ L_{\mathbf{q}} &= \frac{\lambda^2}{\mu \left(\mu - \lambda\right)} \\ \lambda &= 2 \frac{\text{customer}}{\text{min}}, \ \mu = \frac{1 \text{ customer}}{15 \text{ sec}} \times \frac{60 \text{ sec}}{\text{min}} = 4 \frac{\text{customer}}{\text{min}} \\ L_{\mathbf{q}} &= \frac{4}{4 \left(4 - 2\right)} = 0.5 \\ W_{\mathbf{q}} &= \frac{L_{\mathbf{q}}}{\lambda} = \frac{0.5}{2} = 0.25 \text{ min} \end{split}$$

- B. This is the value for the average number of customers in the waiting line $-L_q$.
- C. This is the value of the mean number of customer arrivals per time period λ .
- D. This is the value of the mean number of customer services per time period μ .

^{*}correct answer

3. [IVA] Risk Analysis - Applications of Monte Carlo Simulation

- A. Implementing the simulation alone cannot determine if it is logically correct. See 4)
- B. Repeating the simulation alone cannot determine if it is logically correct. See 4)
- Validation ensures that the simulation model is an accurate representation of the real system.
- D. Verification is mainly a debugging task to make sure that no errors are in the computer procedure that implements the simulation.*

4. [IXB] Integer Programming - Computer Solution

A. Multiple choice constraint is used when only one of the multiple projects must be selected.

(e.g.,
$$w_1 + w_2 + w_3 = 1$$
)

B. Because the acceptance of project A is necessary for the acceptance of project B and vice versa, the appropriate constraint is corequisite where both projects must be selected.*

$$(e.g., w_1 + w_2 = 2)$$

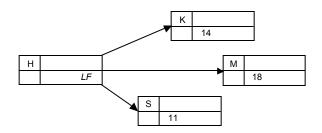
C. The k-out-of- n alternatives constraint is an extension of the multiple choice constraint. It is used when more than one out of a multiple projects must be selected. This is an example of a 2-out-of-5 alternatives constraint.

(e.g.,
$$w_1 + w_2 + w_3 + w_4 + w_5 = 2$$
)

D. Mutually exclusive constraint is used if a "no' selection or zero is also a possible choice.

(e.g.,
$$w_1 + w_2 + w_3 \le 1$$
)

- 5. [XA2] Project Scheduling Projects with Known Activity Times Determining Critical Path
 - A. See C.
 - B. See C.
 - C. Since the latest start (LS) for S is week 11, it needs to be started prior to K (LS = 14) and M (LS = 18), the latest finish (LF) for H has to completed in week 11. H S is the critical path and not H K or H M.*



- a. Based on the Critical Path,
- b. LF(H) = LS(S) = 11
- D. See C.

Other Important Information and Resources

Registration Information

Register online—Go to <u>www.excelsior.edu/examregistration</u>. Follow the simple instructions to register using your Visa, MasterCard, American Express, or Discover Card.

Register by phone—Call toll free 888-72EXAMS (888-723-9267)

Register by mail—Mail registration is not available for the MBA exams.

Excelsior College Bookstore

The Excelsior College Bookstore is staffed Monday through Thursday from 7 AM to 9 PM, Friday from 7 AM to 6 PM, Saturday from 8 AM to 5 PM, and Sunday from noon to 4 PM Eastern time.

To order by phone, call 800-325-3252

To order by fax, call 800-325-4147

To order materials online, anytime, visit the bookstore at www.excelsior.edu/bookstore.

Pearson VUE

Web site: www.pearsonvue.com/excelsior

Call center: 888-926-9488

For More Information

For more information regarding Excelsior College Examinations, access the downloadable Excelsior College® Examinations Registration and Information: A User's Guide at www.excelsior.edu/exams.

Frequently Asked Questions (FAQ)

I took some of these courses as an undergraduate student. Do I need to take these exams?

Answer:

No. In general, you do not have to take the graduate foundation courses if you have taken and passed upper-level, undergraduate-equivalent courses with a grade of "B" or better within the last ten years. Please contact your advisor (www.excelsior.edu/messagecenter) and see if the corresponding foundation course can be waived.

How do I sign up for the exams?

Answer:

You can register for the exams either online or by phone. However, you must obtain an approval by your advisor prior to the registration.

What is the cost of the exam? Does the exam qualify for financial aid?

Answer: The cost of the exam is \$300. The exam does not qualify for financial aid.

Do I get any course credits if I pass the exam?

Answer:

No. You will not receive any credits. If you pass the exam, however, you will not be required to take the corresponding graduate foundation course.

I did not pass the exam. Can I take it over again?

Answer:

No. You only have one chance to pass the exam. However, you are allowed to take another foundation exam. In general, you are allowed only one attempt for each foundation exam.

Am I required to purchase the textbook for the exam?

Answer:

No. You are not required to purchase the textbook. However, it is a good idea to obtain a copy through a purchase or a library loan. This will allow you to go through the content and materials as a review for the exam.

What do I do if I am not able to take the exam at the scheduled time?

Answer:

You must reschedule your exam by **7:00** PM **Central time** on the business day before the scheduled appointment time, or at least 24 hours before the scheduled time, whichever comes first.

Can I share the test questions with others?

Answer:

Absolutely not! This would violate the academic honesty policy of the College. Excelsior College actively monitors the Web and other public forums to make sure the integrity of the exam is not compromised. Any violation to this policy will result in the disqualification of your exam results and/or further disciplinary and legal actions.

Are the exams available internationally?

Answer: Yes. You can take the exam at Pearson VUE authorized test centers worldwide. There is an additional \$10 charge.

Notes

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