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| **C:\Users\ashkanani\AppData\Local\Microsoft\Windows\INetCache\Content.Word\AACSB-logo-accredited-vert-color-RGB.JPG** | **Kuwait University****College of Business Administration****Information Systems & Operations Management Department** |  |

**Course Syllabus**

Dr. Raed Al-Husain

ISOM 110 –Business Mathematics – Spring 2025

**Section 03A** Monday, Wednesday 9:30 AM – 10:45 AM Room 01-C1-1005

**Email** raed.husain@ku.edu.kw

**Office** 2nd Floor, ISOM Department, Office # S020B1019

**Office Hours** Monday, Wednesday 11:00 AM – 12:00 PM (or by appointment)

**Teaching Assistant** TBA
**Email** TBA

**Textbook** Introductory Mathematical Analysis (13th Ed., or Arab World Ed.) authors: Ernest Haeussler, Richard Paul and Richard Wood

**Course Website** [Moodle](https://moodle.ku.edu.kw/) + Microsoft Teams

**Course Description:**

This course provides an in-depth exploration of key mathematical concepts essential for students in business, economics, and social sciences. Using the textbook *"Introductory Mathematical Analysis For Business, Economics, and the Life and Social Sciences,"* we will focus on calculus, linear algebra, and optimization techniques relevant to these fields. The course begins with an introduction to differentiation, covering basic rules, applications, and advanced methods such as implicit differentiation, logarithmic differentiation, and higher-order derivatives. We will also explore integration, focusing on both indefinite and definite integrals, techniques of integration, and their applications in solving business-related problems.

In addition, the course will delve into matrix algebra, covering operations such as matrix addition, multiplication, inverses, and solving systems of equations using matrices. Finally, we will examine optimization techniques, including the study of relative extrema, the second derivative test, applied maxima and minima, partial derivatives, and the use of Lagrange multipliers for constrained optimization.

Students will gain practical skills in applying mathematical analysis to solve real-world problems in their respective fields, equipping them with the analytical tools necessary for business decision-making and economic analysis.

**COURSE LEARNING OBJECTIVES (CLOS):**

This course aims to give students a comprehensive understanding of mathematical techniques essential for solving business-related problems. By the end of the course, students should be able to:

* **CLO1**: Apply differentiation and integration techniques to solve business, economics, and life sciences problems.
* **CLO2**: Utilize matrix algebra to solve systems of equations and optimize solutions in business scenarios.
* **CLO3**: Demonstrate proficiency in using optimization methods, including relative extrema, second derivative tests, and Lagrange multipliers, to solve business problems.
* **CLO4**: Analyze and interpret real-world business problems using partial and higher-order derivatives for decision-making and optimization.
* **CLO5**: Communicate mathematical analysis results effectively in written and oral forms, applying them to business decision-making contexts.

**CLO MAPPING TO CBA SKILL-BASED COMPETENCY GOALS[[1]](#footnote-1)**

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| CLO | Competency Goal |
| Analytical | Communication | Information Technology | Business Ethics | General Business Knowledge |
| 1 | I |  |  |  |  |
| 2 | I |  |  |  | I |
| 3 | I |  |  |  |  |
| 4 | I |  |  |  |  |
| 5 | I |  |  |  | I |

Note: ‘I’ indicates Introduce and ‘R’ indicates Reinforce

**COURSE OUTLINE**

| **Topic** | **Key Topics** | **Readings** | **Quiz** | **Exams** |
| --- | --- | --- | --- | --- |
| Differentiation | * 1. The Derivative
	2. Rules of Differentiation
	3. The Derivative as a Rate of Change
	4. Product and Quotient Rule
	5. The Chain Rule and the Power Rule
 | CH 11 | Quiz 1 | Midterm Exam Wed. 6/11/2024 |
| Additional Differentiation Topics | 12.1 Derivative of Logarithmic Function12.2 Derivative of Exponential Functions12.4 Implicit Differentiation12.5 Logarithmic Differentiation12.7 Higher Order Derivatives | CH 12 | Quiz 2 |
| Curve Sketching | 13.1 Relative Extrema13.4 Second Derivative Test13.6 Applied Maxima and Minima | CH 13 | Quiz 3 |
| Multivariable Calculus | 17.1 Partial Derivatives17.4 Higher Order Partial Derivatives17.6 Maxima and Minima for Functions of Two Variables17.7 Lagrange Multipliers | CH 17 | Quiz 4 |  |
| Integration | 14.2 The Indefinite Integral14.3 Integration with Initial Conditions14.4 More Integration Formulas14.5 Techniques of Integration14.7 The Fundamental Theorem ofIntegral Calculus15.1 Integration by parts117.9 Multiple Integrals | CH 14Section 15.1Section 17.9 | Quiz 5 |  |
| Matrix Algebra | 6.1 Matrices6.2 Matrix Addition and Scalar Multiplication6.3 Matrix Multiplication6.4 Solving Systems by Reduction6.6 Inverses | CH 6 | Quiz 6 |  |

**GRADING AND COURSE REQUIREMENTS**

* All dates (EXCEPT for the final) may change due to class circumstances and holidays. Always check online for the latest version of the syllabus and course calendar.

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| **Weight** | **Category** | **Description** |
| **10%** | **Tutorials** | You must register in the tutorial of this course on KU Portal and attend the tutorial sessions. |
| **20%** | **Quizzes** | We will have a total of six quizzes, with one quiz following each chapter. To accommodate for any lower performance, the quiz with the lowest score will be dropped, and the remaining five quizzes will each contribute 4% to your overall grade. |
| **30%** | **Midterm Exam** | Wednesday, **November 6, 2024**, from 12:30 PM to 2:00 PM, covering chapters 11 – 13.Please note that no makeup exams will be offered, so it is crucial that you do not miss this exam under any circumstances. |
| **40%** | **Final Exam** | The final exam is comprehensive but will primarily focus on the chapters covered after the midterm. It will take place on Monday, **May 19, 2025**. Please be aware that there will be no opportunities for a retake of the final exam. Missing the final will result in an automatic FA grade. |

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| **Grade Distribution**

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| --- | --- |
| **Grade** | **Range** |
| A | ≥ 92 |
| A- | ≥ 88 and < 92 |
| B+ | ≥ 84 and < 88 |
| B | ≥ 80 and < 84 |
| B- | ≥ 76 and < 80 |
| C+ | ≥ 72 and < 76 |
| C | ≥ 68 and < 72 |
| C- | ≥ 64 and < 68 |
| D+ | ≥ 60 and < 64 |
| D | ≥ 56 and < 60 |
| F | < 56 |

 | **Important Dates**

|  |  |
| --- | --- |
| **Date** | **Event** |
| Wed. 6/11/2024 | Midterm  |
| Thu. 15/5/2025 | Last Day of Classes |
| Mon. 19/5/2025 | Final Exam |

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**CLASS PARTICIPATION**

The success of our classroom environment largely depends on your active participation and preparation for each session. To be well-prepared, you should (1) read the relevant textbook sections before each class, (2) think critically about how the mathematical concepts apply to real-world business, economics, and life sciences scenarios, and (3) consider how these mathematical techniques can be used to solve practical business problems. Remember, the quality of your questions and contributions during discussions is more important than the quantity. Active engagement and thoughtful participation will enhance both your learning and the overall class experience.

**TUTORIALS**

You must register for the tutorial sessions of this course through the KU Portal. Attendance at the tutorials is mandatory, as they account for 10% of your total grade. More importantly, these sessions are an essential part of the learning process, where key practice exercises are discussed and solved with the Teaching Assistants (TAs). These exercises will help reinforce the material covered in lectures and provide valuable hands-on experience with the mathematical techniques needed for success in the course. Missing these sessions can significantly impact both your understanding of the material and your overall performance.

**QUIZZES**

We will have a total of six quizzes in this course, with one quiz scheduled after the completion of each chapter. To ensure fairness, the quiz with the lowest grade will be dropped, and only the top five quiz scores will count towards your total quiz grade, which is worth 20% of your final grade. This means each quiz will be worth 4% of your overall grade. Please note that there will be no makeup quizzes, so it is important to attend each quiz as scheduled. The quizzes will test both your conceptual understanding and your ability to apply the mathematical techniques covered in class.

**ASSIGNMENTS**

While no homework assignments will be given during regular class sessions, there will be homework assignments provided during the tutorial sessions. Completing these assignments is part of your tutorial grade, which accounts for 10% of your overall course grade. Although the assignments are graded as part of the tutorial, their primary value lies in reinforcing the mathematical concepts taught in the course. They are a vital part of the learning process, helping you practice and apply the techniques needed for success in this class. Completing these assignments will significantly improve your understanding and performance.

**MIDTERMS**

We will have only one midterm exam, which will take place after the completion of Chapters 11, 12, and 13, and it will account for 30% of your total course grade. The exam will consist of problems that require you to show all the steps taken to arrive at the solution. Simply providing the final answer will not be sufficient—points will only be awarded if the complete solution process is clearly demonstrated. Please note that no makeup exams will be given, so it is essential that you do not miss this exam.

**FINAL EXAM**

The final exam is comprehensive, covering all material from the course, but will primarily focus on the chapters covered after the midterm. It will account for 40% of your total course grade. As with the midterm, the exam will consist of problems that require you to show all the steps taken to arrive at the solution. Simply providing the final answer will not be enough—points will only be awarded if the complete solution process is clearly demonstrated.

**Exam Rules:**

* **Identification**: You must bring and display a valid Kuwait University student ID at the examination.
* **Late Arrival**: If you arrive late, you will only have the remaining time to complete the exam. Once the first student submits their exam, no additional students will be allowed to start, and late arrivals will receive an FA grade.
* **Questions During the Exam**: No questions regarding the exam content will be permitted unless you believe there is a typographical error. Understanding the questions is part of the exam challenge. If you need to make assumptions, ensure they are clearly stated in your response.
* **Time Expiry**: You are not allowed to continue working on the exam once time has expired. This includes filling in answers after time is called.

Make sure to prepare thoroughly, as no retakes or makeup exams will be allowed.

**ATTENDANCE**

Attendance in this class is mandatory. Although no specific grade is assigned for attendance, missing class sessions or arriving late will significantly affect your learning experience. You are responsible for catching up on any material missed by coordinating with your classmates. Please note that if you are absent for six class sessions, you will automatically receive an FA grade for the course.

In addition to these policies, you must adhere to the Kuwait University Policy on Attendance, as outlined in the student bylaws. You can access a copy of the bylaws online at:

<http://vpaa.ku.edu.kw/ar/documents/KU%20ByLaws/Students/Curriculum_Regulations.pdf>

**ACADEMIC INTEGRITY**

The University's code of academic integrity is designed to ensure that the principles of academic honesty and integrity are upheld. All students are expected to adhere to this Code. All acts of academic dishonesty will be dealt with in accordance with the provisions of this code. Every student in this course must abide by the Kuwait University Policy on Cheating and Plagiarism (published in the student bylaws). A copy of the student bylaws can be accessed online on:

<http://vpaa.ku.edu.kw/ar/documents/KU%20ByLaws/Students/Curriculum_Regulations.pdf>

In particular,

* You should neither give nor receive assistance from anyone in taking the quizzes, assignments, and final exam.
* You should immediately report to me any act of academic dishonesty that you may observe. Your anonymity will be protected.

Cheating includes (but not limited to):

* Using unauthorized notes during the examination.
* Using unauthorized devices during the examination
* Communicating with anyone besides instructor or exam proctor.
* Looking at another student's work during the examination.
* Copying another student’s work.
* Having someone else take the exam on your behalf.

**OTHER COURSE POLICIES**

Your fellow-students and I need 100% of your attention and mindshare while the class is in session. Toward this end:

* For each class, please arrive sufficiently ahead of the official start time in order to collect any handouts or prior quizzes that have been graded and get yourself ready with your notes and papers.
* Please do not walk around, or out of, the classroom, while class is in session.
* All electronic gadgets must be turned off (not turned to vibrate, but actually turned off!) while class is in session. For the purpose of this bullet, if your gadget has an on/off switch, it is an electronic gadget.

**Special Needs:** If you have a disability and/or special needs, you should bring this to my attention as soon as possible, but not later than the second week of class.

**CBA COMPETENCY GOALS**

1. **Analytical Competency:** A CBA graduate will be able to use analytical skills to solve business problems and make a well-supported business decision.

**Student Learning Objectives:**

* 1. Use appropriate analytical techniques to solve a given business problem.
	2. Critically evaluate multiple solutions to a business problem.
	3. Make well-supported business decisions.
1. **Communication Competency:** A CBA graduate will be able to communicate effectively in a wide variety of business settings.

**Student Learning Objectives:**

* 1. Deliver clear, concise, and audience-centered presentations.
	2. Write clear, concise, and audience-centered business documents.
1. **Information Technology Competency:** A CBA graduate will be able to utilize Information Technology for the completion of business tasks.

**Student Learning Objectives:**

* 1. Use data-processing tools to analyze or solve business problems.
1. **Ethical Competency:** A CBA graduate will be able to recognize ethical issues present in business environment, analyze the tradeoffs between different ethical perspectives, and make a well-supported ethical decision.

**Student Learning Objectives:**

* 1. Identify the ethical dimensions of a business decision.
	2. Recognize and analyze the tradeoffs created by application of competing ethical perspectives.
	3. Formulate and defend a well-supported recommendation for the resolution of an ethical issue.
1. **General Business Knowledge:** A CBA graduate will be able to demonstrate a basic understanding of the main business disciplines’ concepts and theories.

**Student Learning Objectives:**

* 1. Acquire a fundamental understanding of knowledge from the main business disciplines (e.g. finance, accounting, marketing, and management information systems, among others).
1. CBA Competency Goals can be found at the end of this document [↑](#footnote-ref-1)