Course Prefix/Number: MATH207
Course Title: Advanced Engineering Math
Class Meeting Times: UTR 10:20-11:10
Class Meeting Times LAB: T 11:30-12:30
Instructional Modality: Online/Onsite

Instructor: Dr. Ali El Saheli
Office Location: A328
Office Phone: 1802040 ext. 3733
Email: aelsaheli@auk.edu.kw
Office Hours: MW 9:00-12:00 by Appointment, Online.

AUK Mission Statement: The American University of Kuwait is a liberal arts institution dedicated to teaching, learning, and scholarship. The University offers programs that provide students with the knowledge and skills necessary for lifelong learning and professional success. AUK enriches society by fostering an environment that encourages critical thinking, effective communication, personal growth, service, and leadership.

Department/College Mission Statement: The College of Arts and Sciences (CAS) is committed to cultivating lifelong learning that empowers students to pursue technical competency in professional fields, self-awareness, a sense of civic and moral responsibility, and a breadth of vision in the tradition of liberal arts education. The College offers quality undergraduate programs leading to a bachelor's degree.

Catalog Course Description:
Calculus III: Functions of Several Variables. Vectors & Geometry of space. Vector Functions. Curvature, Motion in Space. Multiple Integrals. Introduction to Vector Integral Calculus: Fields, Line & Surface Integral, Green's, Stroke's, & Divergence Theorems.
Linear algebra: Linear Systems & Matrices including Determinants, Linear Systems of Equations, Eigenvalues & Eigenvectors.
Complex Variables (Only the 4-credits students): Complex numbers and functions, differentiation and integration

Course Learning Outcomes: Upon successful completion of the course, students will be able to:

1. 1. Visualize geometry in 3D space.
2. Understand matrices and their operations, and solve related problems.
3. Solve systems of linear equations using matrices, and Eigenvalue problems.
4. Define vector-valued functions to describe curves and surfaces in space.
5. Use vector-valued functions to describe the motion of objects through space.
6. Evaluate iterated double and triple integrals.
7. Use multiple integrals to calculate areas, volumes, masses and center of mass for plane regions and solids.
8. Define line integrals, surface integrals and the three "big" theorems: Green's theorem, Stokes' theorem, and the Divergence theorem.
9. Use complex numbers, their operations, complex functions and their basic calculus.

Course Delivery/Methodology: For this course we will be meeting in-person 3 times per week, and material will be presented through lectures and/or videos. All course material will be posted on Moodle. All assignments must also be submitted through Moodle or Pearson.
It is your responsibility to make sure you have internet connection during tests and lectures. Also make sure you have access to scanning Apps to use them for submitting your tests if needed. Free Apps such Cam Scanner, Genius Scan or ScanBot are good ones that are available for free on the net. Only PDF files are accepted.

Required Textbook/Required Readings:

Textbook: For the Linear Algebra and Complex Variables parts we will use *Advanced Engineering Mathematics*, Kreyszig. (Any edition available on the internet can be used).
For the Calculus III part we will use *Thomas' Calculus plus Pearson MyLab Mathematics with Pearson eText in SI Units*,14th Edition. eCampus BookStore: https://elearn.growmorelearn.com/auk/auth/login
Readings: PDF and/or PPT lecture notes available on Moodle and/or the S-Drive via Moodle.

Recommended: Video lectures on Moodle. Not to replace live lectures.

Evaluations and Grading:
1. Quiz1 – 5%: Thursday October 28, 2021 during class time on Pearson MyLabMath or Moodle.
2. Midterm Test – 20%: During midterm exam period.
3. Quiz2 – 5%: Thursday December 02, 2021 during class time on Pearson MyLabMath or Moodle.
4. Quiz3 – 5%: Thursday December 23, 2021 during class time on Pearson MyLabMath or Moodle.
5. Quiz4 – 5%: Thursday January 06, 2022 during class time on Pearson MyLabMath or Moodle.
6. Final Exam - 40%: On campus, Cumulative, Date and time TBD by the Registrar's.
7. Homework Assignments – 20%: Four HWs. See below for details.

AUK Official Grading Scale:

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Percentage	[94 - 100]	[90 - 93)	[87 - 89)	[84 - 86)	[80 - 83)	[77 - 79)	[74 - 76)	[70 - 73)	[67 - 69)	[64 - 66)	[60 - 63)	[0 - 59)
University Points	4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.7	0.0

Important Note: To pass the course, your grade should be at least **70%**.

AUK Attendance Policy: Any student who misses more than 15% of class sessions of any course during a semester should expect to fail, unless she/he submits documented evidence to the course instructor of inpatient medical care, death of an immediate family member, academic instructional activities, or national athletic activities. If excused, students are required to satisfy all coursework due or assigned during their absence as determined by the course instructor. If a student does not submit documented evidence for her/his absence exceeding the limit, it is the student's responsibility to withdraw from the course by the specified deadline, as indicated on the academic calendar. Students who withdraw from a course receive a grade of "W". Students who do not withdraw from a course nor submit supporting documents for excessive absences will receive a grade of "FN" (failure for non-attendance).
All Students whether on-campus or online are expected to be on time.
Students attending classes online are allowed tardiness for up to 5 minutes due to technical issues.
Students attending classes online must turn their cameras on at eye level, or risk being removed from the class session.

Code of Academic Honesty and Integrity: Upon admission to the American University of Kuwait, students agree to act responsibly in all areas of academic, personal and social conduct and to take full responsibility for their individual and collective action. Such regulations are found in the American University of Kuwait Catalogue, Student Handbook, and the AUK website at www.auk.edu.kw. Any question of interpretation regarding the code of academic honesty and Integrity shall be reported to the appropriate academic dean. The Code shall be reviewed annually at the discretion of the academic deans. Any student or student organization found to have committed the cited violations or misconduct, either on or off campus, is subject to the disciplinary sanctions outlined in adjudication procedures.

CODE OF CONDUCT
Video recording of class sessions (by instructors and/or students) is prohibited and is a violation of the university codes.
The privacy of the session is to be maintained (no other members of the household should be available during the sessions).

Professional physical appearance is expected during online classes. All participants in the online class should ensure proper attire and setting (blurred background can be used to accommodate settings).
Copyright as well as intellectual property rules and regulations apply.
MASKS are to be worn properly all the time when on campus grounds. Repeated violations of the MASK policy will result in removal from class and/or campus.

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Academic Support: Learning Support Services focuses on empowering students to become independent and successful learners by developing their literacy skills, enhancing their understanding, and helping them improve their academic and study skills. Learning Support Services is comprised of two centers: the Tutoring Center and the Writing Center. The Tutoring Center provides free academic support in various subjects to AUK student. Email: tutoringcenter@auk.edu.kw.

The Writing Center provides multilingual support (English, Arabic, French, and Spanish) through individual or small-group consultations. Email: writingcenter@auk.edu.kw

Disability Accommodations: AUK provides equal and inclusive educational environment in order to enable all students to meet and perform requisite academic standards and to participate in the opportunities and activities of its community. If you believe you can benefit from accommodations for a learning, physical, or mental health disability, click here to book a session through the Counseling Center/Disability Services Booking Page, to ask about disability services at AUK, initiate an accommodation plan, or receive disability services. You can also email counseling@auk.edu.kw if you need assistance in booking a session.

Course Policies/Student Responsibilities:
Class participation is a very important part of the learning process in this course. Although not explicitly graded, you will be evaluated on the QUALITY of your contributions and insights.

You are expected to come to/join class on time. To be attentive and engaged in class. To refrain from using laptops, cell phones and other electronic devices during class. To spend an adequate amount of time on the homework each week, making an effort to solve and understand each problem. To engage with both the abstract and computational sides of the material. And to seek help when appropriate.

As research on learning shows, unexpected noises and movement automatically divert and capture people's attention, which means you are affecting everyone's learning experience if your cell phone, pager, laptop, etc. makes noise or is visually distracting during class.

For this reason, I strongly ask you to turn off your mobile devices and close your laptops during class. I allow you to take notes on your laptop, but you must turn the sound off so that you do not disrupt other students' learning.

Late and Missing Work Policy: If you miss a test/quiz you have to provide a legitimate, documented excuse (such as a verifiable valid Doctor's note), otherwise you will automatically be assigned a zero mark.

Make-Up Work Policy: If you provide a legitimate, documented excuse (such as a verifiable valid Doctor's note), the weight of the missed test/quiz will be moved to the final exam.

Testing Policy: You are not allowed to obtain any kind of assistance with your tests, and only standard (non-programmable, non-graphical) calculators are allowed. Your tests should be totally your own work. Tests will be

multiple choice, open response questions or a combination of these, as the instructor sees fit. Multiple choice tests will be in sequential format, which means that you can navigate through the test only forward. Any attempt at circumventing this will result in a mark of zero without any exception.
If you "think" there is a problem with a question, solve it to the best of your understanding /knowledge. After the test, email me about it and I will look into it.
After a test is done you have one week to discuss and/or contest your mark. After that you cannot discuss or contest your mark.

Homework: HW assignments are designed to lead up to the quizzes/test, so they should be done as preparation for them, and their due date is the day before the quizzes/test 10 pm.
HWs will be announced one week before due date.
The extra-long deadline for the HWs is to avoid any deadline problems due to technical problems. So make sure you do it asap. Once the deadline passes, the HW won't be available on Pearson and you get zero for that HW.

Quizzes: will be done from **home for all students**.

Technical Problems: It is totally your responsibility to make sure you sign up for the course with Pearson so that you can do the homework assignments and quizzes and submit them in the due time.
Any problems with your Pearson account should be directed to Pearson support team.

In case of any internet problems during testing situations, you should contact your internet provider. You should provide documentation of the problem from the internet provider.

In case of any Moodle problems during the Test or Final, you should contact the IT department. You should provide documentation of the problem from the IT dept.
Most problems with Pearson occur because students forget their user name or password. To avoid this, make sure you write this information down when you create your account. In case of problems with your account you need to contact Pearson support team immediately to solve the problem to avoid missing a HW or a Quiz.

I have no control over the internet, your Pearson account or Moodle. Do not contact me regarding these problems. These are your responsibility.

Communication Policy: Please be sure to use your official AUK email account, write your full name, and indicate which class and section you are taking when you send me an email. If you have a question, please check the syllabus first and if your question is not answered there, then please feel free to send an email and I will be happy to clarify. I respond to questions via email or posted on the discussion forum within 24 hours of receiving them; if I do not respond within 24 hours, please re-send the email. Emails sent on weekends will be responded to on Sunday.

Syllabus Changes: There may be changes to the schedule and syllabus during the semester. When this happens, I will inform you in class and by email.

Table of Contents/Course Schedule

(Thomas)	(Thomas)
12.1 Three-dimensional coordinate systems. 12.2 Vectors. 12.3 The dot product. 12.4 The cross product. 12.5 Equations of lines and planes. 12.6 Cylinders and quadric surfaces. 13.1 Vector functions and space curves. 13.2 Derivatives and integrals of vector functions.	13.3 Arc length 14.1 Functions of several variables. 14.3 Partial derivatives 14.4 Tangent planes and linear approximations. 14.5 The chain rule. 14.6 Directional derivatives and the gradient vector.

(Thomas)	**(Thomas)**
15.1 Double integrals over rectangles. 15.2 Double integrals over general regions. 15.3 Double integrals in polar coordinates 15.4 Applications of double integrals. 15.5 Surface area.	15.6 Triple integrals 15.7 Triple integrals in cylindrical coordinates. 15.8 Triple integrals in spherical coordinates. 13.2 Polar Form of complex numbers. Powers and Roots (Kreyszig)

(Thomas)	**(Kreyszig)**
16.1 Vector fields. 16.2 Line integrals. 16.3 The fundamental theorem for line integrals. 16.4 Green's theorem. 16.5 Curl and divergence. 13.3 Derivative. Analytic Function. 13.4 Cauchy–Riemann Equations. Laplace's Equation. 13.6 Trigonometric and Hyperbolic Functions. Euler's Formula	13.7 Logarithm. General Power. Principal Value 14.2 Cauchy's Integral Theorem 14.3 Cauchy's Integral Formula 7.1 Matrices, Vectors: Addition and Scalar Multiplication 7.2 Matrix Multiplication 7.3 Linear Systems of Equations. Gauss Elimination 7.7 Determinants. Cramer's Rule 7.8 Inverse of a Matrix. Gauss–Jordan Elimination 8.1 The Matrix Eigenvalue Problem. Determining Eigenvalues and Eigenvectors

(Kreyszig)	
13.5 Exponential Function	

Fall 2021 Schedule *		
Week	**Odd University ID numbers** (ending with 1, 3, 5, 7, 9) For example: S00012345	**Even University ID numbers** (ending with 0, 2, 4, 6, 8) For example: S0003456
September 26-30	**Online (All Students)**	
October 3 - 7	On-campus	Off Campus: Online study only
October 10-14	Off Campus: Online study only	On-campus
October 17-21	On-campus	Off Campus: Online study only
October 23	**Online (All Students)**	
October 24-28	Off Campus: Online study only	On-campus
October 31 – November 4	On-campus	Off Campus: Online study only
November 7-11	Off Campus: Online study only	On-campus
November 14- 18	**Midterm Exams – Online (All Students)**	
November 21-25	On-campus	Off Campus: Online study only
November 28 – December 2	Off Campus: Online study only	On-campus
December 5- 9	On-campus	Off Campus: Online study only
December 12-16	Off Campus: Online study only	On-campus
December 19-23	On-campus	Off Campus: Online study only
December 26-30	**Winter break – University Closed**	
January 2- 6	Off Campus: Online study only	On-campus
January 9-13	On-Campus	Off Campus: Online study only
January 16-20	**Final exams -On Campus (All Students)**	
*Schedule is subject to change per Private Universities Council decisions		
Online Classes will be held in real time, i.e. synchronously, according to class schedule. **Moodle**, the university's mandated learning management system (LMS) is the main gateway to access online classes at AUK.		

As per the most recent instructions received by the Private Universities Council (PUC), mid-terms are to be conducted on campus. As a result, the university will extend mid-terms over a period of two weeks in order to accommodate both odd and even cohorts of students. Accordingly, from November 14-18, students with the **Odd** University ID numbers will conduct their mid-terms on campus while students with the **Even** University ID numbers will engage in online asynchronous learning. From November 21-25, students with the **Even** University ID numbers will conduct their mid-terms on campus while students with the **Odd** University ID numbers will engage in online asynchronous learning:

Week	**Odd University ID numbers** (ending with 1, 3, 5, 7, 9) For example: S00012345	**Even University ID numbers** (ending with 0, 2, 4, 6, 8) For example: S0003456
November 14- 18	Mid-term – on campus	Online-Asynchronous instruction
November 21-25	Online-Asynchronous instruction	Mid-term – on campus

With the asynchronous learning, students who are online during the mid-term period will be accessing and completing lectures, readings, homework, and/or project assignments during that assigned time. Students will log into their Moodle accounts during their class-time and follow the assigned instructions of their professors.