

I. Course Information

Academic unit	School of Engineering										
Department	Engineering										
Code	GEN350										
English Title	Mathematics for Engineers										
French or Arabic Title (when applicable)											
Type	<input checked="" type="checkbox"/> C	<input type="checkbox"/> CTP	<input type="checkbox"/> TP	<input type="checkbox"/> P	<input type="checkbox"/> TD	<input type="checkbox"/> S	<input type="checkbox"/> TH				
Pre-requisites	MAT307 or MAT310, MAT337 or MAT313, MAT227 or MAT220										
Co-requisites											
Number of credits	3										
Contact hours per week	3										
Delivery Language:	<input type="checkbox"/> French	<input checked="" type="checkbox"/> English	<input type="checkbox"/> Arabic	<input type="checkbox"/> Other (specify):							
Offered	<input checked="" type="checkbox"/> Fall	<input checked="" type="checkbox"/> Spring	<input type="checkbox"/> Summer								
Current Semester	202610										
CRN	10613										
Class Schedule	MF 2:00 pm - 3:15 pm										

II. Course prerequisite knowledge and skills

Students should have a solid foundation in basic mathematics before registering for the mathematics for engineers course. This includes a strong understanding of algebra, geometry, trigonometry, and calculus. Additionally, students should be comfortable with mathematical reasoning and problem-solving techniques. Prior to registering for this course, students should have developed skills in manipulating equations, solving mathematical problems, and understanding mathematical models.

Overall, students should have a solid mathematical background and the necessary skills to effectively apply mathematical concepts to engineering problems. This will ensure a successful and productive experience in the mathematics for engineers course.

III. Instructor

Name and Title	Rita Harb (Dr.)
Category	<input checked="" type="checkbox"/> Full-time <input type="checkbox"/> Part-time
Office	H215A

Email / Teams	ritaharb@usek.edu.lb <i>Replies are to be expected within the following 2 working days</i>
Office hours	Tuesday: 11h00 am – 12h45 pm and Thursday 02h00 pm – 03h30 pm

IV. Course Core Information

Course Description

The main objective of this course is to complete the knowledge of mathematics for the student-engineer. It mainly covers the following themes: Functions of a Complex Variable, analytical functions, Cauchy-Riemann conditions. Harmonic functions. Cauchy integrals Formulas. Special functions: Gamma and Beta functions. Bessel function. Orthogonal functions (Hermite functions). Application of the mathematical theorem in the engineering fields.

Course Goals

The main goals of the mathematics for engineers course are to provide engineering students with a strong mathematical foundation and to equip them with the necessary mathematical tools and techniques to solve engineering problems.

Delivery Mode

The delivery mode of a course that includes both lecturing and problem solving is designed to provide students with a comprehensive learning experience. Lecturing sessions serve as a platform for instructors to present and explain key concepts, theories, and principles to students. Through lectures, students gain a solid understanding of the subject matter and its practical applications. Additionally, problem-solving sessions are incorporated to allow students to actively engage with the material and apply their knowledge to solve complex problems. These sessions provide opportunities for students to practice analytical reasoning, and problem-solving skills. The combination of lecturing and problem solving ensures that students receive both theoretical knowledge and practical skills, enabling them to effectively grasp and apply the course content.

V. Course Learning Outcomes (LOs)

Enter all learning outcomes for the course (minimum 3, maximum 6). These may be mandated by the department. All learning outcomes should be measurable. Use “Action Words” as per the institutional guidelines: Writing Learning Outcomes.

After a successful completion of the course, students will be able to:

1. Understand the concepts of complex variables, analytic functions.
2. Evaluate integrals of complex valued functions.
3. Use the special functions to simplify the computing of integrals.
4. Use the Bessel function and the orthogonal functions for resolving a differential equation.

VI. Course General Requirements

Writing Requirements

Students must be able to write precisely and coherently on the course topics in a manner that is comprehensible for the reader. Examples of such writing can be found in published papers, manuals, textbooks, and expository articles aimed at non-expert audiences.

Add any specific requirements related to your course.

Oral Requirements

Students must be able to express their thoughts clearly, pronounce correctly, listen actively, and participate effectively in discussions. Presentation skills, such as organization, confident delivery, and engaging the audience, are also important. Students should be adaptable in their communication style, open to different viewpoints, and demonstrate critical thinking skills.

Add any specific requirements related to your course.

Technical Requirements

Students should have basic computer literacy, including proficiency in word processing, internet research, and email communication. Additionally, depending on the field, students may need specific technical skills like programming, data analysis, laboratory techniques, or software proficiency.

The minimum technical skills required vary depending on the program or field of study. Students may need specific technical skills like programming, data analysis, laboratory techniques, or software proficiency. Add any specific requirements related to your course.

VII. Course Timetable and detailed schedule

Timetable

Week	Topic	LO(s)	Assessment Activities	Learning Activities
1	Complex Numbers Algebraic, exponential, and trigonometric form	1	Assignment Test	Interactive lecturing session

2	Derivatives Limit	1	Assignment Test	Interactive problem solving
3	Laplace's Equation	1	Assignment Test	Group problem solving
4	Trigonometric and Hyperbolic functions Logarithm. General Power	1	Assignment Test	Problem solving
5	Line Integral in the Complex Plane	2	Assignment Test	Interactive lecturing session
6	Cauchy's Integral Theorem	2	Assignment Test	Interactive lecturing session
7	Cauchy's Integral Formula	2	Assignment Test	Problem solving
8	Gamma function	3	Assignment Test	Problem solving
9	Beta function	3	Assignment Test	Group problem solving
10	Bessel functions	4	Assignment Test	Interactive problem solving
11	Bessel functions	4	Assignment Test	Group problem solving
12	Orthogonal functions	4	Assignment Test	Interactive lecturing session
13	Orthogonal functions	4	Assignment Test	Interactive problem solving
14	Application of the mathematical theorems in the engineering fields	1, 2, 3, 4	Assignment Test	Interactive lecturing session
15	Final Exams			

Schedule of Holidays, Make-up Sessions, Evaluations dates and Deadlines for Assignments.

USEK Academic calendar can be found at www.usek.edu.lb.

Week	Month	Date	Day	Specific Announcement
1	September	1	Monday	Start of Classes
2				
3				
4				

5				
6	October	10	Friday	Test 1
7				
8				
9				
10				
11	November	14	Friday	Test 2
12				
13				
14				
15	Final Exams			

VIII. Course Material

Required Texts	<Advanced Engineering Mathematics, John Wiley 10 th edition, E. Kreyszig> <Shaum's Outline of advanced Calculus, 3 rd edition 2010, R. C. Wrede, M. Spiegel>
Supplemental References	<Advanced mathematics for Engineers and Scientists – Murray Spiegel. Shaum's Outline of advanced Calculus, 3 rd edition 2010, R. C. Wrede, M. Spiegel>
Required Materials	

IX. Course Grading System

Provide information about each assignment and assessment activity and specify their weight in the overall grade.

All course grades will be regularly shared with students, preferably on the e-learning platform.

The course final examinations date will be published by the Registrar Office in due time. No test or examination shall be given during the last two weeks before the regular examination period.

Passing grade

A minimum grade of is required for this course.

The Grading policy can be found in the **Academic Rules and Regulations** published on the website.

Grading criteria

Grading Criteria (Total = 100%)	
10%	Attendance and active participation
10%	Homework, project, assignments.
40%	Quizzes, Tests, Midterm.
40%	End of semester evaluation

X. Course Policies and Support to students

The USEK **Academic Rules and Regulations** is the official document of record concerning academic programs and regulations. It can be found at www.usek.edu.lb.

Class attendance policy

Students can, for valid and justified reasons, be absent for a number of teaching hours equal to three teaching weeks (20% of the course's number of hours, i.e., 9 hours = 6 sessions of an hour and 15 minutes each). However, they are responsible for learning material covered in class and will fail all graded class activities (quizzes, tests, presentations, discussions, etc.) organized during these absences.

Students who exceed the authorized limit of absences will not be allowed to sit for their final exam. They must officially withdraw from the course before the official deadline, otherwise, they will be given the grade FW (Fail to Withdraw).

Students with an excused absence will be permitted to make up coursework or complete an equivalent assignment agreed upon with the instructor.

Absence to Mid-term and final exam

A student who does not show up for the Mid-term and final exams, for any reason, is given, by the teacher, a failing grade of zero. If this absence is due to special justifiable circumstances, such as:

- Death of a family member or relative.
- Hospitalization, attested by a medical report from the hospital.
- Tested positive to COVID-19, attested by a PCR test with a QR code.
- Serious accident, attested by an official report from a sworn expert.

Then the student can present a petition with supporting documents at the Student Affairs Office within the 24 hours following the missed exam. The request will be accepted for a valid justification or in case of a recurrence. A student who has shown up for the exam cannot, in any case, present a petition for a make-up exam.

The Mid-term and final exams policy can be found at www.usek.edu.lb.

Late Submission

Assignments are expected to be submitted by the designated deadlines. Late submissions may result in grade penalties unless prior arrangements have been made with the instructor.

Academic Integrity

Plagiarism and any form of academic dishonesty are strictly prohibited. All work submitted must be your own, unless otherwise specified.

Students are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in an academic penalty of the student failing the assignment and may result in additional disciplinary measures. This includes, but not limited to, improper citation of sources, using another student's work, and any other form of academic misrepresentation. Suspicions of use of artificial intelligence aids will be considered as alleged violations of Cheating.

The Academic Integrity policy can be found at www.usek.edu.lb.

Netiquette

Students are expected to communicate with each other and with the instructor in a learning community. They are expected to be respectful, polite, and knowledgeable during oral and written communication and when posting to the class discussion forums.

Course Evaluation Survey

Completion of the online course evaluation survey is required. Students will not be able to access their course grade until they have completed the course evaluation.

Arrangements for Students with Special Needs

USEK empowers students to manage challenges and limitations imposed by special needs. Students with disabilities are encouraged to contact the Access Office by sending an email to accessoffice@usek.edu.lb, for any accommodation needed to fulfill course requirements (within the first week of the semester).

Writing Center

The USEK Writing Center offers writing assistance to students. Its main mission is to develop their writing skills and provide free writing support for students of all levels and at any stage of the writing process by offering in-person consultations during which writers can brainstorm ideas, adopt different writing approaches and strategies, and receive feedback from a well-trained tutor. For assistance student are encouraged to contact the center by sending an email to writingcenter@usek.edu.lb.

Technical Support

The Enterprise and Information Technology Services (EITS) at USEK provides essential assistance to students for resolving technical issues and ensuring smooth access to digital resources. It offers guidance and troubleshooting for hardware and software problems, assists with network connectivity, and helps students navigate learning management systems and online platforms.

Latest Update on	Signature
21/08/2025	