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**Department of Physics**

**College of *Science***

**University of *Salahaddin-Erbil***

**Subject: *Complex Analysis***

**Course Book*: Third year -General physics***

**Lecturer's name: Assis. *Zozan Omer Ismail***

**Academic Year: *2022-2023***

**Course Book**

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| **1. Course name** | Complex Analysis |
| **2. Lecturer in charge** | Zozan Omer Ismail |
| **3. Department/ College** | mathematics / Science |
| **4. Contact** | E-mail(1): zozan.ismail@su.edu.krd |
| **5. Time (in hours) per week**  | 2 theory +1 discussion  |
| **6. Office hours** |  |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | My name is Zozan Omer Ismail. I graduated from mathematical Department/ College of Education in Salahaddin University-Erbil in 7-1-1994, in Erbil, Iraq. I have got Master of Science in Fluid Mechanics. Since 2-8-2006. I am working as an assistant lecturer in mathematics department / college of science / Salahaddin University-Erbil. |
| **9. Keywords** |  Complex numbers, Modulus, Analytic Function, ComplexIntegration |
| **10. Course overview:**  Complex Analysis will cover many important materials like complex numbers and their geometric representation, analytic functions complex integration, …, and it is applicable in many different subjects in pure and applied mathematics, physics and engineering. |
| **Course objective:** The overall goal of the field of complex analysis is the study of complex numbers and its representation with elementary complex functions. Also, to introduce students to the topic of Complex Analysis and some of the major issues involved, including Analytic Functions, Complex Integration with applications in physics and Sequence and Series of Complex Numbers.  |
| **12. Student's obligation:** Students and their obligations throughout the academic year, is the attendance and completion of all tests, exams, assignments.  |
| **13. Forms of teaching:** E- learning, Magic board, sometimes data show, discussion and allow students to write some problems on the board and assignments and I give hard copy of my lecture notes to students before coming lecturer time  |
| **14. Assessment scheme*****Theoretical:*** 40% (one Midterm exams and other activities, home works and quizzes).***Final Exam:***  ***Theoretical:*** 60% |
| **15. Student learning outcome:**Students will be learning to concept of complex number algebraically and geometrically. learn to find powers and roots of complex numbers, learn to find limits and integration of complex functions , and students will be learn the concept of analytic functions.  |
| **16. Course Reading List and References:** 1. "Complex analysis for mathematics science and engineering ", E.B.saff and A.D.Sinder, 1993.
2. "Complex Analysis and applications", William R.Derrick.
3. "Complex variable and applications",James Ward Brown, and Ruel V.Churchill.
4. "Complex Variables ", Murray R.Spuegel, Seymour Lipschutz, John J.Schiller,Dennis Spellman,(Schaumm's Outline Series), Second edition, 2009.

5- الدوال المعقدة سمير بشير حديد و يحيى عبد سعيد |
| **17. The Topics:** | **Lecturer's name** |
| **Chapter Two**: Analytic Functions Regions in the Complex Plane. Functions of complexes variable, Limits and Continuity, Analyticity, The Cauchy Riemann equations, Harmonic Functions.**Chapter three: Elementary Functions**The Exponential, Trigonometric and Hyperbolic Functions, The logarithmic Functions, Complex Powers and Inverse, Trigonometric Functions**Chapter four: Complex Integration**Contours, Contour integrals, Independence of path, Cauchy's integrals theorem, Cauchy's integrals formula and its consequences |  |
| **18. Practical Topics (If there is any)** |  |
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| **19. Examinations: Compositional:** In this type of exam the questions usually starts with Explain how, furthermore it is like as lecture notes and contains some homework , so there will be continuing assignments of problem outside the lecture notes (note that this problem having small marks).  |
| **20. Extra notes:** |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ**  |