FIZ321E, Mathematical Methods in Physics - I
Course Syllabus
Spring 2021

Instructor: Dr. **Hakkı Tunçay ÖZER**
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Tuesday 08:30-10:30, ZOOM
Thursday 08:30-10:30, ZOOM
Friday   09:30-10:30, ZOOM

Office Hours: Tues.,10:30 to 12:00, Thurs., 10:30 to 12:00 ZOOM by appointment.

References:
  ❖ Mathematical Methods for Physicists,G.B. Arfken & H.J. Weber,
  ❖ Mathematical Methods of Physics, J. Mathews & R.L. Walker,
  ❖ Applied Mathematical for Engineers and Physicists ,L.A. Pipes & L.R. Harvill,
  ❖ Complex Variables and Applications ,J. W. Brown & R.V. Churchill ,
  ❖ Mathematics for Physicists ,P. Dennery & A. Krzywicki.

Course Outline:
  ❖ Complex Analysis: Complex numbers, Analytic functions, Cauchy's Theorem, Taylor and Laurent series, calculus of residues.
  ❖ Second order ordinary differential equations: solutions of homogeneous differential equations, singularities and series solutions, Frobenious method.
  ❖ Linear Vector Spaces: Function spaces, Gram-Schmidt orthogonalization
  ❖ Sturm- Liouville Theory: Self-adjoint differential equations, boundary value problems.
  ❖ Special Functions: Legendre, associated Legendre, Hermite, Laguerre, Chebyshev polynomials, Bessel functions.

Course Success Criterias:
  ➢ Quiz: 4 or 6 , can be any day a week (except midterm week).
  ➢ Homework: 4 or 6 , every friday.
  ➢ Midterm : 22 April.
  ➢ VF condition: To take the final exam, getting at least 20 points out of 100 points within the year, otherwise your grade will be VF.
  ➢ Final Exam is scheduled by automation between 14-27 June 2021
  ➢ Grading : Quiz 25%, Homework 5%, Midterm 30%, Final 40%.