

PHYS 503 METHODS OF MATHEMATICAL PHYSICS I
Spring Semester:20122

Instructor:

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Course Web Page:

<http://www.metu.edu.tr/~kseckin/PHYS503.html>

Schedule:

Monday: 13:40-16:30 P422

Recitations:

TA: Gönül Ünal

Textbooks:

F.W.Byron & R.W.Fuller, *Mathematics of Classical and Quantum Physics*, Dover 1992.

G.B.Arffen & H.J.Weber, *Mathematical Methods for Physicists*, Academic Press, 1995.

Supplementary References:

J.W.Brown & R.V.Churchill, *Complex Variables and Applications*, McGraw-Hill, 2009.

F. B. Hildebrand, *Advanced Calculus for Applications*, 2nd Edition, Prentice-Hall 1976.

Grading:

There will be two midterm examinations and a final. Each midterm will contribute 30% and the final exam will contribute 40% toward your final grade.

Exam Dates and Places:

1st Midterm Exam: 30 March 2013, Saturday

2nd Midterm Exam: 18 May 2013, Saturday

Final Exam: **To be announced later.**

Course Content:

- Functions of a complex variable, Analytic functions, Cauchy's integral theorem
Taylor and Laurent series
Singularities of analytic functions & the residue theorem
Methods of finding residues
Evaluation of definite integrals using residue theorem
Residues at infinity
Integral Involving Branch Points
Conformal Mapping (Time Permitting)
- Sturm-Liouville Theory and Orthogonal Functions
- Gamma and related functions
Bessel's Functions
Legendre Polynomials & Spherical Harmonics
Laguerre, Hermite, Chebyshev Polynomials,
Hypergeometric and related functions (Time Permitting)