

## MAIN TEXT

Mathews and Walker “*Mathematical Methods of Physics*”

## SUPPLEMENTARY TEXTS

Arfken “*Mathematical methods for physicists*”

Wyld “*Mathematical methods for physics*”

Volkovskii, Lunts, and Aramanovich “*A collection of problems on complex analysis*”

Courant and Hilbert “*Methods of mathematical physics*”

Tikhonov and Samarskii “*Equations of mathematical physics*”

Budak, Samarskii, and Tikhonov “*A collection of problems in mathematical physics*”

Vladimirov “*Equations of mathematical physics*”

Vladimirov “*A collection of problems on equations of mathematical physics*”

## COVERED MATERIAL (TENTATIVE)

### Quarter 1

- Ordinary differential equations (including series solutions of Bessel and Legendre equations)
- Wronskian, Sturm-Liouville, eigen-values, eigen-functions, Green's function
- Summation of series
- Contour integration

### Quarter 2

- Fourier and Laplace transforms
- Introduction to generalized functions
- Green's function of linear differential, diffusion, wave, Laplace, Helmholtz, etc., operators
- Partial differential equations not requiring special functions

### Time permitting

- Various approximation techniques: steepest descent, estimation of integrals, WKB, iterations

## COURSE LOGISTICS

**Name:** Prof. SLAVA SEROTA  
**Office:** Rm. 429, ext. 60538  
**E-mail:** serota@physunc.phy.uc.edu      slava.serota@uc.edu  
**URL:** http://physuna.phs.uc.edu/~serota/      http://serota.phy.uc.edu/