



**PH205 August 3:0**

## **Mathematical Methods of Physics**

### **Instructor**

B Ananthanarayan

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### **Teaching Assistant**

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Email:

**Department: Physics**

Course Time: 8:30-10:00

Lecture venue: Physical Science Auditorium

Detailed Course Page:

## **Announcements**

### **Brief description of the course**

Introduction to the main methods of mathematical physics, linear vector spaces, matrices and determinants, infinite dimensional spaces, Hilbert spaces, differential equations, complex analysis

### **Prerequisites**

None

### **Syllabus**

Linear vector spaces, linear operators and matrices, systems of linear equations. Eigen values and

eigen vectors, classical orthogonal polynomials. Linear ordinary diffe

rential equations, exact and

series methods of solution, special functions. Linear partial differential equations of physics,

separation of variables method of solution. Complex variable theory; analytic functions. Taylor and

Laurent expansions, classifica

tion of singularities, analytic continuation, contour integration,

dispersion relations. Fourier and Laplace transforms.

## **Course outcomes**

Students receive an all round introduction to this fundamental course and can build on the deliverables from this course to attack problems in condensed matter physics, elementary particle physics and astrophysics theory, and also apply this if they become experimentalists

## **Grading policy**

20% for homework, 30% for midterm, 50% for final exams

## **Assignments**

Several problem sets are assigned. Not possible to upload.

## **Resources**

Arfken, Webber and Harris, Mathematical Methods

Mathews, J., and Walker, R.L., Mathematical Methods of Physics, Benjamin, Menlo Park, California, 1973.

Dennery, P., and

Krzywicki, A., Mathematics for Physicists, Harper and Row, NY, 1967.

W yld, H.W ., Mathematical Methods for Physics, Benjamin, Reading, Massachusetts, 1976.