



ENGR 257

NAME & NUMBER OF COURSE

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**SYNONYMOUS COURSES:**

(a) replaces \_\_\_\_\_  
(course #)

(b) cannot take Phys 381/Math 381 for further credit  
(course #)

**SUPPLIES/MATERIALS:**

**TEXTBOOKS, REFERENCES, MATERIALS** (List reading resources elsewhere)

**TEXTBOOKS:**

*Advanced Mathematics for Scientists and Engineers*, Murray R. Spiegel

**OBJECTIVES:**

To give the student the ability to model a system, physical or otherwise, as a series of mathematical equations. To give the student the ability to solve these equations.

**METHODS:**

Lecture, demonstration, small group practice, discussion, audiovisual presentation, use of models and charts.

**STUDENT EVALUATION PROCEDURE:**

Assignments	25%
Midterm	30%
Final exam	45%

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**COURSE CONTENT**

1. A week of review including tricks of interchanging limits (differentiating under the integral sign, integrating series term by term etc.). Introduction to the big D operator techniques for solving differential equations.
2. Fourier Series.
3. Fourier Integrals.
4. Special Functions I (Gamma, Beta, Ei, Si, Erf).
5. Special Functions II (Bessel functions, Legendre, Hermite, Laguerre polynomials) Sturm-Lioville systems.
6. Partial differential equations, definition, classification and various methods of solution.
7. Calculus of Variations and applications.