

**Tennessee Technological University**  
**Mathematics Department**

**MATH 6530: Integral Equations and Applications**

**I. COURSE DESCRIPTION FROM CATALOG:**

Linear Integral Equations: Volterra and Fredholm Types. Green's Functions. Hilbert-Schmidt and Fredholm Theories. Neumann Series. Iterative Methods. Lec. 3. Cr. 3.

**II. PREREQUISITE(S):**

Consent of instructor

**III. COURSE OBJECTIVE(S):**

This course is designed to provide instruction in techniques used in solving integral equations commonly encountered in natural sciences and engineering.

**IV. TOPICS TO BE COVERED:**

1. Integral Equations, Origin, and Basic Tools
2. Modeling of Problems as Integral Equations
3. Volterra Integral Equations
4. The Green's Equations
5. Fredholm Integral Equations
6. Existence of the Solutions: Basic Fixed Point Theorems

**V. ADDITIONAL INFORMATION:**

First fifteen minutes (if needed) of each class period will be devoted to answer questions either on homework or anything related to the material that was covered in the previous classes. Remaining time is used to lecture on the new material. Occasionally students may be asked to solve problems or present ideas on the chalkboard.

**VI. POSSIBLE TEXTS AND REFERENCES:**

*Introduction to Integral Equations with Applications*, 2<sup>nd</sup> edition, by Abdul J. Jerri, John Wiley & Sons, 1999

*Integral Equations* by Harry Hochstadt, John Wiley & Sons, 1973

*Method of Applied Mathematics* by F.B. Hilderbrand, Prentice-Hall, 1961

*A Course on Integral Equations* by A.C. Pipkin, Springer-Verlag, 1991

*Integral Equations* by B.L. Moiseiwitsch, Pitman Press, 1977

**VII. ANY TECHNOLOGY THAT MAY BE USED:**

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). 1  
An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119.