THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

# Electromagnetic Field Theory II

## ECE 7010

**Credit Hours:**
3.00 - 3.00

**Course Levels:**
Graduate (5000-8000 level)

**Course Components:**
Lecture

**Course Description:**
Green's functions with applications; spectral representation of sources; sources in layered media and Sommerfeld integrals; time-domain fields, retarded potentials, and transients; periodic structures; integral equations.

**Prerequisites and Co-requisites:**
Prereq: 6010 (719).

**Course Goals / Objectives:**
- Learn spectral representation of sources, and solve for fields due to sources in layered media using Sommerfeld integrals
- Learn applications of dyadic Green's functions
- Learn about time-domain fields, retarded potentials, and transients
- Learn about periodic structures, Floquet modes, and band diagrams

**Course Topics:**

- Sturm-Liouville problem and construction of one-dimensional Green's functions.
- Review of complex analysis
- Construction of two- and three-dimensional Green's functions with examples and applications
- Spectral representation of sources and Sommerfeld integrals
- Fields in layered media
- Dyadic Green's functions
- Time-domain fields, retarded potentials, and transients
- Periodic structures, Floquet modes, and band diagrams
- Selected topics in current research

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**Designation:**

Elective