(1) Course Details:

Instructor: BRANISLAV M. NOTAROS, Associate Professor, Eng C101C, Phone: (970) 491-3537
E-mail: notaros@colostate.edu, Web: www.engr.colostate.edu/~notaros

Class Meetings: Tuesday, Thursday 11:00am-12:15pm, Engineering B1

Office Hours: Tuesday 12:30pm-1:30pm, Thursday 12:30pm-1:30pm, or by appointment

- Lecture notes provided by the instructor.

Reference Texts:

(2) Course Description:

Course description:
Advanced time-harmonic electromagnetics concepts, with in-depth studies of electromagnetic waves, radiation, guidance, and scattering.
Maxwell's equations, radiation, boundary value problem, dyadic Green's functions, scattering theory. Prerequisite ECE641.

(3) Evaluation of Students and Grading Policy:

- Homework and projects (~15%)
- Exam 1 (~25%)
- Exam 2 (~25%)
- Final Exam (~35%)
(4) **Organization of Course Topics:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>No. of Weeks (tentative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Time-varying electromagnetic fields</td>
<td>1</td>
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<tr>
<td>2</td>
<td>Energy, power flow, and forces, electromagnetic theorems</td>
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<td>3</td>
<td>Electromagnetic potentials, radiation and scattering equations</td>
<td>1</td>
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<tr>
<td>4</td>
<td>Antenna principles</td>
<td>2</td>
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<tr>
<td>5</td>
<td>Wave equations and their solutions</td>
<td>2</td>
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<tr>
<td>6</td>
<td>Wave propagation, polarization, reflection, and transmission</td>
<td>2</td>
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<td>7</td>
<td>Waveguides and cavity resonators</td>
<td>2</td>
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<tr>
<td>8</td>
<td>Analysis of multiconductor transmission lines</td>
<td>1</td>
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<tr>
<td>9</td>
<td>Electromagnetic scattering</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Numerical techniques for time-harmonic electromagnetics</td>
<td>1</td>
</tr>
</tbody>
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(5) **Course Objectives/Outcomes:**

- The course will provide students with advanced electromagnetics concepts and in-depth understanding of electromagnetic waves, radiation, and scattering.
- Students will develop analytical skills in applied electromagnetics and ability to combine mathematical tools and physical understanding to effectively solve complex electromagnetic wave problems.
- The course will expose students to examples of real-world applications of advanced electromagnetic theory, covering propagation, guidance, radiation, and scattering of electromagnetic waves.
- Students will develop basic understanding of numerical techniques for high-frequency time-harmonic field and wave computation.
- The course will enable students to identify interesting and important research topics for Master’s and Ph.D. work.