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|  | 2025   |  | 1 |          | DISU361                                       |  | 01    |
|  |  |  |   |          |   |  | 3-0-3 |
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|  | EECE261( )                                   |  |   |          |   |  |       |
|  |  |  |   |          |   |  |       |
|  | ( 11:00 12:15 ) -                            |  |   |          |   |  |       |
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| E-Mail   | DYNA22@POSTECH.AC.KR                         |  |   | Homepage | HTTPS://SITES.GOOGLE.COM/VIEW/ACEM-POSTECH/HO |  |       |
|  |  |  |   |          | 054-279-2215                                  |  |       |
| Office Hours   | Tue / Thu 1:30pm - 2:30pm (offline & online) |  |   |          |   |  |       |
|  |  |  |   |          |   |  |       |
| <p>This course serves as an extension of the introductory Electromagnetics course (Introduction to Electromagnetism, EECE261), delving beyond the static domain into more advanced theories and applications of time-varying electromagnetic fields. Specifically, it covers (i) the principles of electromagnetic wave generation, (ii) uniform plane waves, (iii) wave reflection and transmission through a slab, (iv) waveguides, (v) radiation, and (vi) transmission line theory.</p> <p>#</p> <p>As applications, the course focuses on two key areas:</p> <ol style="list-style-type: none"><li>1. Computational electromagnetics methods for numerically solving Maxwell's equations, with an emphasis on the widely used finite-difference time-domain (FDTD) method.</li><li>2. A concise theory and practical examples of metasurfaces, which enable flexible control over the reflection and transmission properties of electromagnetic waves.</li></ol> <p>#</p> <p>By taking this course, students will gain a broader perspective on the theories and applications of time-varying electromagnetics.</p> |  |  |   |          |   |  |       |
| /  |  |  |   |          |   |  |       |
| Introduction to Electromagnetism (EECE261) or foundational knowledge of electromagnetic theory (basic understanding of vector calculus and Maxwell's equations).   |  |  |   |          |   |  |       |
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| HWs (30%)#   |  |  |   |          |   |  |       |
| Midterm exam (30%)#  |  |  |   |          |   |  |       |
| Final exam (40%)   |  |  |   |          |   |  |       |

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|  |                                 |  |             |  |         |  | ISBN                                    |
| Field and Wave Electromagnetics (Pearson New International Edition)  |                                 |  | David Cheng |  | Pearson |  | 2013                      9781292038940 |
| Field and Wave Electromagnetics (Pearson New International Edition)  |                                 |  | David Cheng |  | Pearson |  | 2013                      9781292038940 |
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| 1. Advanced Engineering Electromagnetics#<br>Constantine A. Balanis#<br>Wiley#<br>ISBN: 9780470589489#<br>#<br>2. Microwave and RF Design of Wireless Systems#<br>David M. Pozar#<br>John Wiley & Sons, Inc.#<br>ISBN: 0-471-33282-2   |                                 |  |             |  |         |  |   |
|  |                                 |  |             |  |         |  |   |
| 1. Introduction to Time-varying Electrogrmanetic Fields#<br>2. Appearance of Electromagnetic Waves & Uniform Plane Waves#<br>3. Wave Reflection & Transmission#<br>4. Waveguides#<br>5. Transmission Line Theory#<br>6. Radiation of Electromagnetic Waves & Antennas#<br>7. Computational Electromagnetics & Finite-difference Time-domain Method#<br>8. Metasurfaces |                                 |  |             |  |         |  |   |
|  |                                 |  |             |  |         |  |   |
| 100% in-person lectures (Zoom streaming available)   |                                 |  |             |  |         |  |   |

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The ultimate goal of this course is to develop a deep understanding of the core principles of electromagnetic theory.##

To achieve this, the lectures will provide the minimum necessary mathematical knowledge and physical insights needed to comprehend electromagnetic theory.##

Therefore, it is recommended to complement the lectures by studying the textbook, reinforcing the material covered in class, and acquiring additional details.##

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Assignments will typically involve computer coding for visualizing electromagnetic fields.##

Through this visualization, students can gain deeper and more intuitive insights into electromagnetic theory.