

ECE-GY 5733 RF and Microwave Systems Engineering

Review of EM theory and transmission lines. Printed transmission lines. S, Z, Y, ABCD parameters, network theory, signal flow graphs, CAD methods. Excitation of waveguides. Single and multisection impedance transformer, power divider, directional coupler, hybrid circuits. Microwave resonator: series, parallel resonators, stubs and cavities. Filter theory and designs, coupled-line filters, Kuroda identities, Chebychev and maximally flat filters.

Prerequisite: ECE-UY 3604.

Weekly Outline:

Lecture 1 Phasor, Impedance matching and Two-port Network (pp. 8-9; 78-79; 173-178, 4th edition)

Lecture 2 Transmission line and Scattering Matrix (pp. 48-51; 56-63; 178-184, 4th edition)

Lecture 3 ABCD Matrix (pp. 188-194; 63-72, 4th edition)

Lecture 4 Microstrip and Impedance Matching & Tuning (pp. 147-150; 228-241, 4th edition)

Lecture 5 Double-stub tuning and Quarter Wavelength Transformer (pp. 72-75; 241-249, 4th edition)

Lecture 6 More Impedance Matching & Tuning (pp. 250-261, 4th edition)

Midterm Exam

Lecture 7 Microwave Filter (pp. 399-415, 4th edition)

Lecture 8 Microwave Filters and RLC Resonators (pp. 272-278; 415-426, 4th edition)

Lecture 9 Power Dividers & Directional Couplers (pp. 317-333; 343-347, 4th edition)

Lecture 10 Noise and Nonlinear Distortion (pp. 496-521, 4th edition)

Lecture 11 Microwave Amplifier Design (pp. 558-570, 4th edition)

Lecture 12 More on Microwave Amplifier Design (pp. 571-601, 4th edition)

Lecture 13 Microwave Systems (pp. 658-708, 4th edition)

Final Exam

Textbook: David M. Pozar, "Microwave Engineering," 4th edition, John Wiley & Sons, Inc (other edition is fine too)

Grading (Midterm 40%; Final 40%; Homework and Class Participation 20%)

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