Final exam review topics for EE 481/581 Microwave Engineering

Chapter 1 Electromagnetic Theory
- Loss tangent, complex permittivity, effective conductivity
- Boundary conditions
- Wave propagation in free space or materials (e.g., v_p, λ, α, …)

Chapter 2 Transmission Line Theory
- TL distributed parameters R, L, G, and C
- TL parameters (e.g., v_p, λ, α, …)
- TL circuits
- Smith charts

Chapter 5 Impedance Matching and Tuning
- Series/parallel lumped elements
- L-networks
- Single-stub tuning
- QWT

Chapter 3 Transmission Lines and Waveguides
- Rectangular waveguides
- Microstrip
- Stripline

Chapter 4 Microwave Network Analysis
- [Z]-, [Y]-, [S]-, and [ABCD]- matrices
- Signal flow graphs

Chapter 7 Power Dividers and Directional Couplers
- Basic properties
- T-junction and resistive dividers
- Wilkinson power divider
- Quadrature (90°) Hybrid & 180° Hybrid,
- coupled line & Lange directional couplers

Chapter 8 Microwave Filters
- Low-pass filter prototypes (Butterworth, Chebyshev, & maximally flat phase)
- Transformations to high-pass, bandpass, & bandstop filters
- Frequency & impedance scaling
- Stepped-impedance low-pass filters
- Stub filter implementation, Richards' transformation, and Kuroda Identities