**National University**





**of Computer & Emerging Sciences**

**Course Outlines of BS Electrical Engineering Degree Program**

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| **Course Title** | Microwave Engineering | | **Course Code** | EE308 |
| **Pre-requisite(s)** | EE407 Wave Propagation and Antenna Theory | | **Credit Hrs** | 03 |
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| **Text Book(s)** | **Title** | Microwave Engineering Third Edition | | |
| **Author** | David M Pozar | | |
| **Publisher** | John Wiley & Sons | | |
| **Ref. Book(s)** | **Title** | Microwave & RF Design of Wireless Systems | | |
| **Author** | David M Pozar | | |
| **Publisher** | John Wiley & Sons | | |
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| **Objective:** | This course will provide a comprehensive understanding of Microwave electronics, components and systems. The main objective is to study the concept of basic microwave engineering and its application in detail. | | | |
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| **Course Contents/Topics** | | | | |
| 1. Introduction to microwave engineering, transmission media, review of electromagnetic, wave equation and the plane-wave solution. | | | | |
| 1. Introduction to waveguides, TM modules, Field Plotting | | | | |
| 1. Wave Parameters, TE modes , Field plotting | | | | |
| 1. Power Consideration in waveguides, Mode Excitation, Waveguide resonators. Waveguide Junctions, H-PLANE/E-Plane Tees, Magic Tees, Couplers, Isolators, Circulators, Microwave Generators | | | | |
| 1. Circular Wave Guides | | | | |
| 1. Two port RF/MW Network representation, Z,Y,H, ABCD parameters: Definition, Transformation, Representation of network properties | | | | |
| 1. Reciprocal Lossless Networks, Shifting reference planes T-parameters, | | | | |
| 1. Signal Flow Graphs (SFGs) Application of SFGs, Design of matching networks, | | | | |
| 1. Review of Transmission Line Theory & the smith chart, L section matching networks | | | | |
| 1. Distributed Element matching networks, Negative resistance | | | | |
| 1. Multi- section Transformers, Binomial and Chebyshev design | | | | |
| 1. Tapered lines, Bode- Fano Criterion | | | | |
| 1. Power Dividers and combiners | | | | |
| 1. Couplers and Hybrids | | | | |
| 1. Review of courses | | | | |