**19EC41P1-MICROWAVE & OPTICAL COMMUNICATION LAB**

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| **Course Category:** | Program Core | **Credits:** | 2 |
| **Course Type:** | Practical | **Lecture-Tutorial- Practice:** | 0 - 0 - 3 |
| **Prerequisite:** | Microwave techniques | **Sessional Evaluation:**  **External Evaluation :**  **Total Marks:** | 40  60  100 |

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| **Course**  **Objectives** | Students undergoing this course are expected tounderstand: | |
| 1. The reflex klystron, it is used as amplifier and oscillator in radar stations and radio stations etc. 2. The wave-guide characteristics 3. The antenna parameters 4. The unknown load impedance measurement using VSWR method. 5. The working of directional couplers. | |
| **Course Outcomes** | Upon successful completion of the course , the students will be able to: | |
| CO1 | Study reflex klystron characteristics and understands how it can be used as an amplifier,oscillator in microwave applications |
| CO2 | Calculate the power in the parts of direction couplers |
| CO3 | Knowthe cut off, free space and guided wavelength of waveguide. |
| CO4 | Know how to power can be mixed and split up phase reversal etc. using magic tee |
| CO5 | Measure Antenna Parameters like Gain , Aperture Area and the directivity |
| CO6 | Know how to measure numerical aperture and bending losses of OFC |
| **Course Content** | **LIST OF EXPERIMENTS**   1. Reflex klystron characteristics –I 2. Reflex klystron characteristics –II 3. Direction couplers 4. Wave guide parameters 5. Characteristics of GUNN diode 6. Characteristics of MAGIC TEE 7. Antenna measurements 8. Measurement of V.S.W.R. 9. Measurement of impedance 10. Measurement of numerical aperture | |

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| **Contribution of Course Outcomes towards achievement of Program Outcomes** | | | | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 2 | 2 | 1 | - | - | 2 | - | - | - | 2 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 1 | - | - | 2 | - | - | - | 2 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 1 | 1 | - | - | 2 | - | - | - | 1 | 3 | 3 |
| CO4 | 3 | 3 | 2 |  | 1 | - | - | 2 | - | 2 | - | 2 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 1 | - | - | 2 | - | - | - | 2 | 3 | 3 |
| CO6 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | - | 2 | 2 | 1 | 3 | 3 |