

<b>REC601</b>		<b><u>MICROWAVE ENGINEERING</u></b>	
<b>Unit</b>	<b>Topics</b>	<b>Lectures</b>	
<b>I</b>	<b>Rectangular &amp; circular waveguides:</b> Introduction to microwave communication and EM spectrum, Rectangular wave guide: Field Components, TE, TM Modes, Dominant TE <sub>10</sub> mode, Field Distribution, Power, Attenuation. Circular waveguides: TE, TM modes. Wave velocities, Microstrip transmission line (TL), Coupled TL, Strip TL, Coupled strip line, Coplanar TL, Microwave cavities	11	
<b>II</b>	<b>Passive microwave devices:</b> Scattering matrix, Passive microwave devices: Microwave hybrid circuits, Terminations, Attenuators, Phase Shifters, Directional couplers: Two-hole directional couplers, S- Matrix of a directional coupler, Hybrid couplers, Microwave propagation in ferrites, Faraday rotation, Isolators, Circulators. S-parameter analysis of all components.	10	
<b>III</b>	<b>Microwave tubes :</b> Microwave tubes: Limitations of conventional active devices at microwave frequency, Two cavity Klystron, Reflex Klystron, Magnetron, Traveling wave tube, Backward wave oscillators, Gyro Devices: Their schematic, Principle of operation, Performance characteristic and their applications.	7	
<b>IV</b>	<b>Solid state amplifiers and oscillators:</b> Transferred electron devices: Gunn-effect diodes & modes of operation. Avalanche transit – time devices: IMPATT diode, TRAPPAT diode, BARITT diode.	5	
<b>V</b>	<b>Microwave Measurements:</b> VSWR meter, Frequency meter, Spectrum analyser, Network analyser, Tunable detector, Slotted line carriage, Power meter, Microwave power measurement, Insertion loss and attenuation measurement, VSWR measurement, Return loss measurement by a reflectometer, Frequency measurement, measurement of cavity Q, Dielectric constant measurement of a solid, EM radiation & measurement.	7	