

BHAVNAGAR UNIVERSITY
B.E. SEM VIII (EC)
EC- 801 OPTICAL COMMUNICATION

WEF 08

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOURS			
6	0	2	100	3	50	50	200

1. FUNDAMENTALS OF OPTICAL FIBER:

Block diagram of general optical Fiber comm. system. Comparison with other communication system. Different. types of optical fiber Applications. Total internal reflection. Acceptance angle. Numerical aperture. Skew rays. Phase & group velocity. Mode coupling, cutoff wavelength. V number.

2. TRANSMISSION CHARACTERISTICS OF OPTICAL FIBERS:

Attenuation like, Material absorption losses, Linear & non linear scattering losses, Fiber band losses, etc.. Dispersion, different types like Inter modal dispersion, Intra modal Dispersion with necessary derivations, overall fiber dispersion, different techniques of reducing dispersion.

3. OPTICAL FIBER CONNECTIONS :

Fiber alignments & joint losses. Fiber splices. Fiber connectors.

4. OPTICAL SOURCE

Absorption & emission of radiation. Einstein relation. population inversion. optical feedback & laser oscillation. Threshold condition for laser oscillation, spontaneous, stimulated emission & lasing. LASER Rate equation. LASER efficiencies, characteristics & structures. LED power & efficiency, structures, characteristics, Modulations.

5. OPTICAL DETECTOR :

Device types, principles, absorption, Quantum efficiency, responsibility, Long wave length cut off, semiconductor photodiodes without internal gain & with internal gain.

6. OPTICAL FIBER RECEIVER

Noises like Thermal noise, dark current noise, quantum noise, Digital signaling etc. Receiver noises, capacitance and bandwidth in P-N, P-I-N and Avalanche photodiode. Different Receiver structures.

7. OPTICAL FIBER SYSTEM :

Optical Transmitter circuit Optical Receiver circuit . System design considerations. Analog & digital system. Different Multiplexing techniques. Applications

BOOKS :

1. OPTICAL FIBER COMMUNICATION BY JOHN M. SENIOR
2. FIBER OPTIC COMMUNICATION SYSTEM D.C. AGARWAL
3. OPTICAL COMMUNICATION SYSTEM JOHN GOWAR (PHI)
4. FIBRE OPTIC IN TELECOMMUNICATION N. SHARMA TATA McGraw Hill
5. AN INTRODUCTION TO OPTICAL FIBERS ALLEN H. CHERIN TATA McGraw Hill

BHAVNAGAR UNIVERSITY
B.E. SEM VIII EC
EC-802 MOBILE COMMUNICATION

WEF 08

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOUR	TUT. HOUR	PRAC. HOUR	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
6	-	2	100	3	50	50	200

1. **INTRODUCTION TO MOBILE COMMUNICATION :**
Applications, A short history of wireless communication, A market for mobile communication,
2. **TELE COMMUNICATION SYSTEM :**
GSM, DECT, TETRA, UMTS, & IMT 2000.
3. **SATELLITE SYSTEMS :**
History, Applications, Basics, Routing, Localization, Handover. examples.
4. **BROADCAST SYSTEMS :**
Overview, cyclic repetition of data, Digital Audio broad casting, digital video broadcasting.
5. **WIRELESS LAN :**
Infrared vs Radio Transmission, Infra structure, & Adhoc Network, IEEE 802.11, Hiper lan, Blue tooth.
6. **WIRELESS ATM :**
Motivation for WATM, wireless ATM, working group, WATM services, reference model, functions, handover, location management, addressing, mobile quality of service, access point control protocol.
7. **MOBILE NETWORK LAYER :**
Mobile IP, Dynamic host configuration protocol, Adhoc networks.
8. **MOBILE TRANSPORT LAYER :**
Traditional TCP 292, Indirect TCP, Snooping TCP, Mobile TCP, Fast re transmit/Fast recovery, transmission/timeout freezing, selective re transmission, Transaction oriented TCP.

1. Mobile communication by jochen schiller pearson Education Asia.
2. Principles of GSM : By V.K. Garg
3. Mobile Communication : By Rajpandya
4. Wireless Communication : By Rappaport

BHAVNAGAR UNIVERSITY
B.E. SEM VIII EC
EC-803 MICROWAVE ENGINEERING

WEF 08

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOUR	TUT. HOUR	PRAC. HOUR	THEORY		PRA/ORAL MARKS	T/W MARKS	
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6	-	2	100	3	50	50	200

1. INTRODUCTION TO MICROWAVE :

Frequency spectrum, Classification of Microwave Band, Advantage and Limitations of Microwave communication.

2. THEORY OF TRANSMISSION LINES :

Concept, Basic line equation, Determination of Attenuation constant (Alpha) and phase constant (Beta), Distortions on transmission lines and condition for distortions line $\lambda/4$ and $\lambda/2$ line, standing waves, VSWR, Impedance matching using stub line, smith chart, solution of transmission line, Problem using smith chart, Type of Transmission lines.

3. WAVE GUIDES :

Review Maxwell's equation. Introduction to wave guides Mathematical Analysis of rectangular wave guides, Concept of phase and Group velocity, TE and TM waves.

4. MICROWAVE TUBES :

Limitations of conventional tubes at UHF and Microwave, Operating principle, performance characteristics and applications of Microwave Tubes like multi cavity klystron, Reflex Klystron, TWT, Magnetron.

5. MICROWAVE SEMICONDUCTOR DEVICES :

Varactor Diode, Varactor Multipliers, SRD Multipliers, Principle of parametric Amplifier, Derivations for Negative Resistance and gain for parametric Amplifier. PIN Diode, Equivalent CKD of PIN Diode under various bias conditions, PIN diode reflective attenuator and switches, PIN Diode phase shifter. Applications of Microwave Diode for Detection and Mixing. Working principle, performance characteristics and applications of Microwave Diodes like Tunnel Diode, Gun Diode, IMPATT and TRAPATT Diode.

6. MICROWAVE COMPONENTS :

Principle of working and performance characteristics of various Microwave components like E-plane Tee, H-plane Tee, Magic Tee, Direction coupler, Isolator and circulators, wave meters.

7. MICROWAVE MEASUREMENTS :

Power measurements, Frequency and wavelength measurement, SWR measurement, Attenuation measurement, cavity. Q-measurement.

8. INTRODUCTION TO RADAR :

Principle of Radar, Radar range equation, Effects of noise, Types of Radar, Doppler effect, principles of MTI Radar, Duplexer, Indicators for Radar receivers.

BOOKS:-

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|---|--------------------------------|
| 1. MICROWAVE TECHNOLOGY | DENNIS RODDY |
| 2. MICROWAVE DEVICES AND CIRCUITS | SAMUEL LIAO (P. H) |
| 3. MICROWAVE ENGG. | SANJEEV GUPTA (KHANNA PUB.) |
| 4. MICROWAVES | K. C . GUPTA |
| 5. INTRODUCTION TO MICROWAVES | WHEELER (P. H.) |
| 6. MICROWAVE CIRCUITS | BHAGWAT |
| 7. ELECTRONIC COMMUNICATION SYSTEM | KENEDY |
| 8. MICROWAVE PROPAGATION TECHNIQUES | D.C. SARKAR (S. CHAND & CO.) |
| 9. MICROWAVE COMMUNICATION: COMPONENTS & CIRCUITS | By HUND McGraw HILL |

Practical and term work shall be based on above syllabus

BHAVNAGAR UNIVERSITY
B.E. SEM VII (EC)
EC- 804-PROJECT

WEF 08

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THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY MARKS	HOURS	PRA/ORAL MARKS	T/W MARKS	
0	0	6	--	0	100	100	200

Student will carry out project /training work based upon following guide lines.

1. Literature survey/ Design/ Fabrication/ Testing/ Evaluation of an Electronic & communication subsystem.
2. Repairing and preparation of maintenance chart/ Fault finding procedure for existing electronic & communication equipment's.
3. Software development work related to Analysis/ Synthesis/ Design for a selected advance topic.
Term work will consist of exhaustive write up covering all aspects of the work done by the student on the selected Project work.
4. The project/training work of 8 weeks to be carried out in industry/research institute related to any of electronics & communication subjects.
5. The student will have option to carry out project work for same 8 week period in college under the guidance of faculty if he/she don't opted for industry.

Term work will consist of exhaustive write up covering all aspects of the work done by the student on the selected project/training work.

Note: To cope up with the loss of lecturer due to 8 weeks project/training, curriculum has been design with only three (3) subjects with 6 hours / week. in such a way that teaching can be done within remaining time of the term satisfactory.