**RAMGARH ENGINEERING COLLEGE**

(Estd. by Govt. of Jharkhand & run by Techno India Under PPP)

# Department of Electronics and Communication Engineering

# SEMESTER-VIII

## OPTICAL FIBRE COMMUNICATION (EC 8118)

Introduction to optical fiber communication – principles and systems, Different types of fibers, SMF & MMF, Ray Theory analysis for step index fiber only.(5L)

Fiber optic transmitters using LEDs and Laser diodes, Bias stabilization of LEDs and Lasers, Driver circuits for analog and digital modulation, Temperature stabilization of laser diodes, Modulation bandwidths of lasers and LEDs(6L)

Fiber optic receivers using PIN and APD photodiodes, photo-diode amplifiers, SNR in PID and APD receivers, Receiver sensitivity, Eye diagram (6L)

Coupling mechanisms of optical power from source to fiber and fiber to photo detector, Transmission characteristics of fibers and their effects on system performance, Selection of optical fiber types for short-haul, long-haul and high speed data links, optical power budget calculations of a fiber optic communication link (6L)

Fiber optic interconnectivity devices for fiber optic communication links and networks: Optical isolators, polarizers, circulators, attenuators, Bragg grating filters, add/drop multiplexers, WDM MUX / DEMUX, fiber amplifiers, guided wave devices as external optical modulators (7L)

Fiber optic analog modulation methods, Sub-carrier multiplexed analog communication principles, IM-DD systems, Fundamentals of optical coherent detection, Optical pulse format for digital communication systems, Performance of a 10 Mb/s digital fiber optic link and a 10 Gb/s data link, Effects of charp and line widths of lasers on system performance
Fiber optic networks for LAN, MAN and WAN – a brief study (7L)

# MOBILE COMMUNICATION (EC 8119)

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signaling. Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signaling. (7L)

General Packet Radio Services (GPRS): GPRS Architecture, GPRS Network Nodes. Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.(5L)

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML). Wireless Local Loop (WLL): Introduction to WLL Architecture, wireless Local Loop Technologies.(8L)

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (WCDMA), and CDMA 2000, Quality of services in 3G.(4L)

Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems, Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.(4L)

Server-side programming in Java, Pervasive web application architecture, Device independent example application(3L)

# SATELLITE COMMUNICATIONS (EC 8122)

Introduction to satellite communication – brief history and overview of satellite Communication (3L)

Orbital mechanics and launchers – equations of the orbit, orbital elements, look angles, Subsatellite points, satellite launching and launch vehicles (6L)

Satellite description – communication subsystem, telemetry, command and ranging Subsystem, attitude control subsystem, electrical power subsystem (7L)

Satellite transponder – Transponder model, channelization, frequency plan, processing(4L)

Satellite link design – basic transmission theory, system noise temperature and G/T ration for earth stations, design of uplink and downlink, atmospheric and ionospheres effects on satellite link (8L)

Earth station – description, earth station antenna, low noise amplifier, up converter, down converter, monitoring and control, VSAT (6L)

# VALUES & ETHICS OF PROFESSION

Science, Technology and Engineering as knowledge and as Social and Professional Activities

Effects of Technological Growth: Rapid Technological growth and depletion of resources, Reports of the Club of Rome
Limits of growth: sustainable development
Energy Crisis: Renewable Energy Resources Environmental degradation and pollution, Eco-friendly Technologies, Environmental Regulations, Environmental Ethics

Appropriate Technology Movement of Schumacher: later developments, Technology and developing notions, Problems of Technology transfer, Technology assessment impact analysis
Human Operator in Engineering projects and industries, Problems of man, machine, interaction, Impact of assembly line and automation. Human centered Technology.

Ethics of Profession: Engineering profession: Ethical issues in Engineering practice, Conflicts between business demands and professional ideals, Social and ethical responsibilities of Technologists, Codes of professional ethics, Whistle blowing and beyond, Case studies.

Profession and Human Values: Values Crisis in contemporary society Nature of values:
Value Spectrum of good life Psychological values: Integrated personality; mental health Societal values: The modern search for a good society, justice, democracy, secularism, rule of law, values in Indian Constitution. Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity Moral and ethical values: Nature of moral judgments; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility.

# INTERNET TECHNOLOGY

An Overview on Internet] The need for an Internet, The TCP/IP Internet, Internet services, Internet protocols and standardization, Review of Network technologies.

Internetworking Concepts :Architectural model introduction, Application level interconnection, Network level interconnection, Properties of the Internet, Internet Architecture, Interconnection through IP Gateways or routers, Internet and Intranet.

Internet Address :Introduction, Universal identifiers, Three primary classes of IP addresses, Classless IP address, Network and Broadcast addresses, Mapping internet addresses to physical addresses (ARP), ARP protocol format, Transport Gateways and subnet addressing, Multicast addressing.

Internet Protocol : Internet Architecture and Philosophy, The concept of unreliable delivery, Connectionless delivery system, The Internet Datagram, Routing direct and indirect delivery, Table driven IP routing, Protocol layering, Reliable stream transport, TCP performance, Bootstrap protocol (BOOTP).

Routing: The origin of Gateway routing tables, Original Internet Architecture and Cores, Core Gateways, Automatic route propagation, Vector distance (Bellman-Ford), routing, Gateway to Gateway Protocol (GGP), Autonomous system concept, Exterior Gateway Protocol (EGP), Interior Gateway Protocol (RIP, OSPF, HELLO), Routing Information Protocol (RIP), Combining RIP, HELLO, and EGP, Routing with partial information.

Enterprise Networking :Corporate networking, Broadband at the Metropolitan area level, High speed dedicated WAN services and switched WAN services,

ISDN, BISDN and ATM services, Frame relay technology and services, Virtual private network concepts PPTP protocol.

Internet Servers:DNS, DHCP Servers, FTP, TELNET, E-Mail

Firewall & Networking :Introduction, Implementation of Firewall, Activities of Firewall, Configuration of firewall, Firewalls & SSL, SSL implementation, Bit implementation of SSL, Use of SSL.