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ok was written by

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Dr.

M.Satyanarayana,

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Kumar, Dr. P.

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be sustainable
in the sense of
efficiency, not
only to satisfy
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to obtain the
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area, (from
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deal with for
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applications are
optical coherence
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This resource includes the latest technological advancements and industry applications while covering the entire fiber ecosystem from installation to troubleshooting. This book presents the use of common tools like LPM (laser source and power meter) to overcome common issues related

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to optical patching and fiber plants and also discusses the use of specialized tools including the optical time domain reflectometer (OTDR) for issues with fiber plants and locating fiber breaks. Readers gain an understanding of the architecture of core TDM, IP, and Optical Access Networks

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overview of the current
and future developments
in optical fibers,

interfaces, transceivers
and backbone networks.

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has been given
to the treatment
of single-mode
fibers the
backbone of
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optical
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systems. It also
offers a

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*detailed
treatment of the
theory behind
optoelectronic
sources (LEDs
and injection
laser diodes),
detectors,
modulators, and
optical
amplifiers.*

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terms of
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presents topics
such as erbium-
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amplifiers

(EDFAs) and wave
length-division
multiplexing
(WDM) along with
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these

fundamental
principles, the
book introduces

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sensors and
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systems along
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book provides a
broad and
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description of
the main
developments
and
achievements in
the lab-on-
fiber
technology
roadmap, also
highlighting

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the new
perspectives
and challenges
to be faced.

This book is
essential for
scientists
interested in
the cutting-
edge fiber
optic
technology, but
also for

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graduate
students.

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The third
edition of this
popular text
and reference
book presents
the fundamental
principles for
understanding
and applying
optical fiber
technology to

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sophisticated
modern telecomm
unication

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systems. Optica
l-fiber-based t
elecommunicatio
n networks have
become a major
information-tra
nsmission-
system, with
high capacity
links

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encircling the globe in both terrestrial and undersea installations.

Numerous passive and active optical devices within these links perform complex transmission and networking

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functions in
the optical
domain, such as

signal
amplification,
restoration,
routing, and
switching.

Along with the
need to
understand the
functions of
these devices

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comes the
necessity to
measure both
component and
network
performance,
and to model
and stimulate
the complex
behavior of
reliable high-
capacity
networks.

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This book is
structured into
12 chapters to

facilitate a
logical
progression of
material and to
enable
straightforward
access to
topics by
providing the
appropriate

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background and
theoretical
support.

Chapter 1 gives
a short
introduction to
optical fiber
communications
by considering
the historical
development,
the general
system and the

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major
advantages
provided by
this
technology.

Chapter 2
discuss about
the quality of
service and tel
ecommunication
impairments. In
Chapter 3 the
concept of the

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optical fiber
as a
transmission
medium is
introduced
using the
simple ray
theory
approach. This
is followed by
discussion of
electromagnetic
wave theory

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applied to
optical fibers
prior to
consideration
of lightwave
transmission
within the
various fiber
types. In
particular,
single-mode
fiber, together
with a more

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recent class of
microstructured
optical fiber,

referred to as
photonic
crystal fiber,
are covered in
further detail.

The major
transmission
characteristics
of optical
fibers are then

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dealt with in
Chapter 4.

Again there is
a specific
focus on the
properties and
characteristics
of single-mode
fibers
including, in
this third
edition,
enhanced

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discussion of
single-mode
fiber types,
polarization
mode
dispersion,
nonlinear
effects and, in
particular,
soliton
propagation.
Chapters 5 and
6 deal with the

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various
transmission
and switching
techniques.

Also discuss
the different
transmission
aspects of
Voice

Telephony.

Chapter 7

describe the
light sources

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employed in
optical fiber
communications.

The other
important
semiconductor
optical source,
namely the
light-emitting
diode, is dealt
with in Chapter
7. Chapter 8
discuss about

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the various
design features
of Optical

Fibers for
communication
systems.

Chapter 9
provides a
general
treatment of
the major
measurements
which may be

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undertaken on
optical fibers
in both the

laboratory and
the field. The
chapter is
incorporated at
this stage in
the book to
enable the
reader to
obtain a more
complete

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understanding
of optical
fiber

subsystems and
systems prior
to

consideration
of these
issues. Chapter
10 on optical
networks
comprises an
almost entirely

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new chapter for
the third
edition which
provides both a
detailed
overview of
this expanding
field and a
discussion of
all the major
aspects and
technological
solutions

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currently being
explored.

Chapter 11

discusses about
the data
communications
methods.

Chapter 12

dealt with the
telecommunicati
on lasers
techniques

A comprehensive

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reference to
noise and
signal

interference in
optical fiber
communications

Noise and
Signal

Interference in
Optical Fiber
Transmission

Systems is a
compendium on

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specific topics
within optical
fiber

transmission
and the
optimization
process of the
system design.
It offers
comprehensive
treatment of
noise and
intersymbol

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interference
(ISI)
components
affecting
optical fiber
communications
systems,
containing
coverage on
noise from the
light source,
the fiber and
the receiver.

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The ISI is modeled with a statistical approach, leading to new useful computational methods. The author discusses the subject with the help of numerous

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applications
and simulations
of noise and
signal
interference
theory. Key
features:

Complete all-in-
one reference
on the subject
for engineers
and designers
of optical

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fiber
transmission
systems

Discusses the
physical
principles
behind several
noise
contributions
encountered in
the optical
communications
systems design,

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including
contributions
from the light

source, the
fiber and the
receiver Covers

the theory of
the ISI for the
binary signal,
as well as

noise
statistics

Discusses the

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theory and the
mathematical
models of the

numerous noise
components

(such as

optical noise,
photodetection

noise and

reflection

noise)

Introduces the

frequency

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description of
the ISI and
provides new

calculation
methods based
on the
characteristic
functions

Provides useful
tools and
examples for
optimum design
of optical

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fiber

transmission

networks and

systems This

book will serve

as a

comprehensive

reference for

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& D engineers,

developers and

designers

working on

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Principles and
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Systems

Noise and

Signal

Interference in

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Optical Fiber
Transmission
Systems

This book
presents
fundamental
passive optical
network
(PON) concepts,
providing you
with the tools
needed to underst

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and, design, and
build these new
access networks.

The logical
sequence of topics
begins with the
underlying
principles and
components
of optical fiber
communication
technologies used

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in access

networks. Next,
the book

progresses from
descriptions of
PON and fiber-to-
the-X (FTTX)
alternatives to
their application to
fiber-to-the-
premises (FTTP)
networks and,

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lastly, to essential
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and maintenance.

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to all the problems

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captures the
essence of this
dynamic and
exciting subject
area by
presenting the

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fundamental
principles of
optical fiber
technology, and
then gradually
developing upon
them to capture
the most
sophisticated
modern
communication
networks.

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optical fibers. The contents include such important topics as self- and cross-phase modulation, stimulated Raman and Brillouin scattering, four-wave mixing, modulation instability, and

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optical solitons.

Many new figures
have been added
to help illustrate
the concepts
discussed in the
book. New to this
edition are
chapters on highly
nonlinear fibers
and and the novel
nonlinear effects

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that have been
observed in these
fibers since 2000.

Such a chapter
should be of
interest to people
in the field of new
wavelengths
generation, which
has potential
application in
medical diagnosis

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and treatments,
spectroscopy, new
wavelength lasers
and light sources,
etc. Continues to
be industry
bestseller
providing unique
source of
comprehensive
coverage on the
subject of

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nonlinear fiber
optics Fourth
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the nonlinear
phenomena
occurring inside
optical fibers

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CHAPTERS on the
properties of

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fibers and their
novel nonlinear
effects

CD-ROM contains:
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package for
designing fiber-
optic
communication
systems called
"OptiSystem Lite"

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and a set of
problems for each
chapter.

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Communication
and Its
Applications
City of Light
Solutions Manual
to Accompany
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COMMUNICATION

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Fiber Optics

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complete, up-to-
date technical
overview of optical
communications.*

*Fibre in the WAN,
MAN, local loop,*

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coverage of*

*Wavelength
Division*

Multiplexing.

*Previews today's
advanced research*

*--tomorrow's
practical*

*applications. Over
the past 15 years,*

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optical fibre's low cost, accuracy and enormous capacity has revolutionized wide area communications--making possible the Internet as we know it. Now a second fibre revolution is underway.

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*Advanced
technologies such
as Wavelength*

Division

Multiplexing

*(WDM) are adding
even more*

*capacity, and fibre
is increasingly the
media of choice in
MANs, campuses,
buildings,*

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communications.*

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communications
systems, interfaces
and engineering
challenges. FDDI,
Ethernet on Fibre,*

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*ESCON, Fibre
Channel,
SONET/SDH and
ATM. WDM:
sparse and dense
approaches,
photonic
networking, WDM
for LANs and
WDM standards.
Fibre in the local
loop, integration*

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and passive optical
networks.

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facing engineers
as they extend
fibre into new
applications and*

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markets. It presents an up-to-the-minute status report on WDM for LANs and MANs, including a rare glimpse at IBM's latest experimental systems. It points to the advanced research most likely to bear fruit:

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*dark and spatial
solitons, advanced
fibres, plastic
technologies,
optical CDMA,
TDM and packet-
networks and
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you're building
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*components and
how they work,
explores the tools
and techniques
used to work with
them and the
devices used to
connect fiber
network, and
concludes with
applications
showing how fibers*

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are used in modern communication systems. It covers both existing systems and developing technology, so students can understand present systems and new developments.

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*Carefully
structured to
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knowledge on
fundamental
issues, Optical
Fiber*

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MATLAB® and
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*explores advanced
modulation and
transmission
techniques of
lightwave
communication
systems. With
coverage ranging
from fundamental
to modern aspects,
the text presents
optical*

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communication techniques and applications, employing single mode optical fibers as the transmission medium. With MATLAB and Simulink models that illustrate methods, it supplies a deeper

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*understanding of
future development
of optical systems
and networks. The
book begins with
an overview of the
development of
optical fiber
communications
technology over
the last three
decades of the*

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20th century. It describes the optical transmitters for direct and external modulation technique and discusses the detection of optical signals under direct coherent and incoherent

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*reception. The
author also covers
lumped Er:doped
and distributed*

*Roman optical
amplifiers with
extensive models
for the*

*amplification of
signals and
structuring the
amplifiers on the*

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*Simulink platform.
He outlines a
design strategy for
optically amplified
transmission
systems coupled
with MATLAB
Simulink models,
including
dispersion and
attenuation budget
methodology and*

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simulation

*techniques. The
book concludes
with coverage of
advanced
modulation formats
for long haul
optical fiber
transmission
systems with
accompanied
Simulink models.*

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Although many books have been written on this topic over the last two decades, most of them present only the theory and practice of devices and subsystems of the optical fiber communications systems in the

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*fields, but do not
illustrate any
computer models*

*to represent the
true practical*

*aspects of
engineering*

*practice. This book
fills the need for a*

text that

emphasizes

practical

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*computing models
that shed light on
the behavior and
dynamics of the
devices.*

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