

Communication Electronics



S.Y.B.Sc. Electronic Science
Paper I Semester-III, EL-231,
CBCS (June-2020-21).

Authors

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Dr. A. V. Patil
Dr. U. P. Shinde
Dr. R. S. Gosavi



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First Edition

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Preface

I have great pleasure to present this book on **Communication Electronics**, S.Y.B.Sc. Electronic Science, of B.Sc (Computer Science). **Paper-I, Semester-III, EL-231, CBCS (June-2020-21)**.

It is written as per the 2020-21 pattern of Choice Base Credit System (CBCS) syllabus of Savitribai Phule Pune University, Pune-411007 implemented from June-2020.

The Author and Co-Author have taken efforts and tried their level best to simplify the difficult concept in Communication Electronic with neat diagram and simple mathematical equation.

The basics of Communication Electronic which requires to understand the concept of various types of Communication such as Base Band Communication, Broad Band Communication, Concept of Noise, signal-to-noise (S/N) ratio, Noise figure and noise temperature Need of modulation and Demodulation.

Continuous-wave modulation techniques: Amplitude, Frequency and Phase Modulation, Definition, Modulation Index, AM Receiver: Demodulator circuit using diode and super-heterodyne receiver, characteristics of receiver: selectivity, sensitivity. FM Modulation using Varactor diode. FM Demodulator: Foster-Seeley detector. Block Diagram of FM communication system.

Concept of PAM, PWM, PPM, Time Division Multiplexing and Frequency Division Multiplexing. Block diagram of digital communication system, bit rate, baud rate and bandwidth. Serial and parallel communication, concept of sampling, Sampling theorem, PCM concept of keying techniques: ASK, FSK, PSK Block diagram of MODEM.

Acknowledgement

Firstly, I thank the Almighty **Allah**, Creator of Universe for making me physically and mentally capable of undertaking this work.

I offer my Sincere thanks to the management of Poona College of Arts, Science and Commerce Camp-Pune-411001, Y and M, Anjuman Khairul Islam Mumbai for providing me the necessary facility to complete the work.

I owe a special debt of gratitude to Dr. Aftab Anwar Shaikh, Principal Poona College of Arts, Science and Commerce, Camp, Pune-411001, Dr. Arunkumar Walunj, Head Department of Electronic Science, Mr Iqbal Shaikh, Head Department of Chemistry and IQAC Coordinator. Dr. Arif Shaikh, Ex-Head Department of Electronic Science, Mr. J.B. Shikalger Ex-Head Department of Electronic Science, Dr. Gulam Rabbani my research Guide for cooperation, motivation and continuous help. Dr. S. N. Kotwal Ex Principal of Poona College, Camp-Pune-1.

The present work is dedicated to my beloved late parents, whose love and affection apart from their moral support made it possible to complete. My wife, Mrs. Shabana, son Azim and lovely daughter Alfiya deserve special mention for their continuous support and sacrifice.

Finally I would like to thank teaching staff members Mr. Musharraf Hussain, Mr. Mohammed Mushtaq, Mr. Abul Kais, Ms. Saima Sayyed and all other teaching and non teaching staff of Electronic Science Department of Poona College, Camp, Pune-411001, all friends and all those who are directly or indirectly involved in helping me to complete this work.

I thank to Publisher IIP Publishing House (IPH) www.iiponline.org for helping me to publish this book.

Dr. Tamboli Arif

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Author **Dr. Arif Tamboli** is working as Associate Professor in the subject of Electronic Science and Department of Electronic Science at Poona College of Arts, Science and Commerce Camp-PUNE-411001 since **1st August-1994**.

The College is affiliated to Savitribai Phule Pune University, Pune-411007, formerly known as University of Pune, is a collegiate public state university located in the city of Pune, Maharashtra state, India. Established in 1949, PUNE-411007.

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Guide for Ph. D. in Physics & Electronic Science – S. P. Pune University, Pune, Total No. of Ph.D. Students guided: Declared– 03, Pursing – 03, Completed Research Projects: 02 (01 Major, 01 Minor), Total No. of Paper Published in National /International Journals: 83, Total No. of Conferences/Workshop/Symposium Attended/ Presented papers- 39, Total No. of Published Book: 03, Resource Person (Invited Talk): 12, Awards: Best paper presentation award at Busan, South Korea, Best Teacher Award 2020 by Mahavir International, Nashik.

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Teaching experience is 33 years, Research papers published in Various journals are 35, Presented 9 Research papers in an International conference and attended several National and State level conferences. Appointed as subject expert by SPPU for the selection of Assistant Professor committee, Appointed as Member by SPPU for various academic committees.

Contents list (List of topics):

Sr. No.	Chapters
1	Unit 1 :Introduction to Electronic Communication
2	Unit 2 : Continuous-wave modulation techniques
3	Unit 3: Pulse Modulation Techniques
4	Unit 4: Introduction to Digital Communication

Index

Unit 1: Introduction to Electronic Communication **1-37**

Introduction to communication- means and modes, Block diagram of an electronic communication system, Electromagnetic spectrum , Brief idea of frequency allocation for radio communication system in India (TRAI), concept of Noise, signal-to-noise (S/N) ratio, Noise figure and noise temperature Need of modulation and demodulation.

Unit 2: Continuous-Wave Modulation Techniques: **38-89**

Amplitude modulation: AM waveform, mathematical expression of AM, concept of Sideband, Definition and problems: modulation index, power distribution. AM using transistor,

AM Receiver: Demodulator circuit using diode and super-heterodyne receiver, characteristics of receiver: selectivity, sensitivity, Image frequency and dynamic range. Block diagram of AM communication system

Frequency modulation: FM waveform, mathematical representation, frequency spectrum, bandwidth and modulation index., problems based on modulation index, frequency deviation, average power. FM Modulation using Varactor diode. FM Demodulator: Foster-Seeley detector. Block Diagram of FM communication system.

Unit 3: Pulse Modulation Techniques **90-122**

Types of analog pulse modulation: concept and generation of PAM, PWM, PPM, Spectra of pulse modulation, concept of time division multiplexing and frequency division multiplexing.

Unit 4: Introduction to Digital Communication **123-155**

Block diagram of digital communication system, advantages of digital communication system, bit rate, baud rate and bandwidth. Serial and parallel communication, concept of sampling, sampling theorem and Pulse Code Modulation. Concept of keying techniques: ASK, FSK and PSK. Block diagram of MODEM.

About the Authors



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Dr. Arun Patil

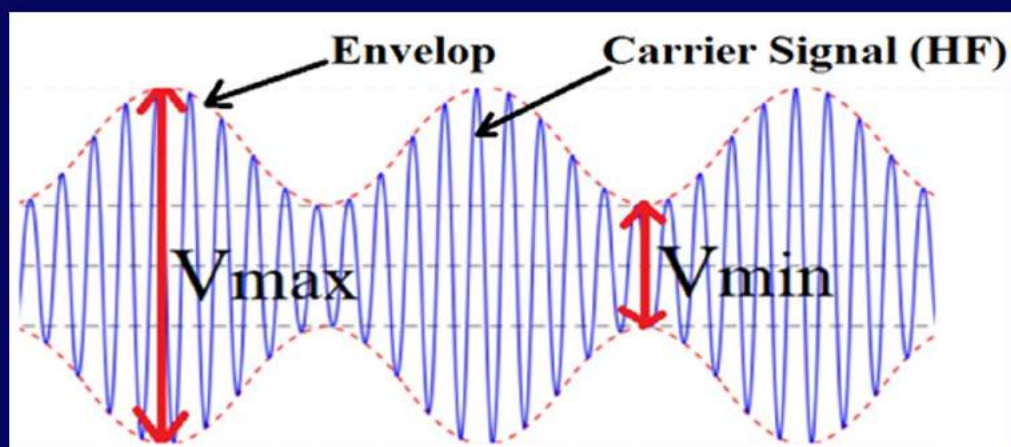


Dr. R. S. Gosavi



Dr. Ugalal P. Shinde

The Book Contains the basics of Communication Electronics. such as Base Band Communication, Broad Band Communication, Noise, signal-to-noise (S/N) ratio, Amplitude Frequency and Phase Modulation, AM and FM Demodulater. PAM, PWM, PPM, TDM, FDM, Digital communication system, bit rate, baud rate, PCM concept of ASK, FSK, PSK Block diagram of MODEM.



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