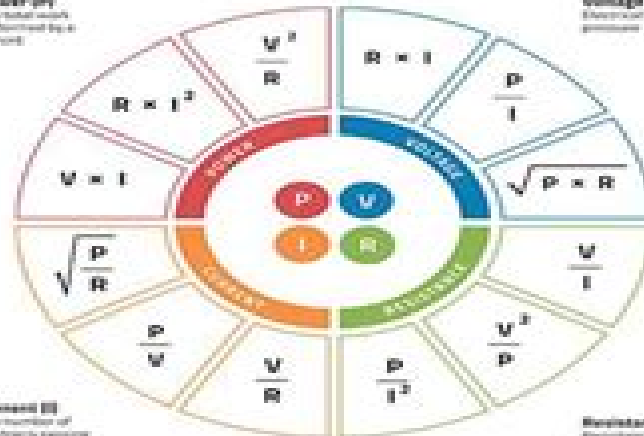


Basic Electronics Theory

Ohm's Law

Power (P)
The total work performed by a circuit



Basic Units

Quantity	Unit
Capacitance	F
Charge	C
Current	A
Energy	J
Force	N
Frequency	Hz
Inductance	H
Magnetic Flux	Wb
Potential	V
Power	W
Resistance	Ω

Kirchhoff's Laws

Closed Loop Rule

The directed sum of the electrical potential differences (voltages) around any closed circuit is zero.

$$\sum \mathcal{E} = \sum IR = 0$$

$$V_{AB} + V_{BC} = V_{AC}$$

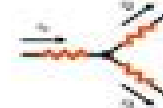


Junction Rule

The sum of currents entering the junction are equal to the sum of currents leaving.

$$\sum I_{in} = \sum I_{out}$$

$$I_1 = I_2 + I_3$$



Resistor Network

Series

$$R_s = R_1 + R_2 + R_3$$



Parallel

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$



Capacitor Network

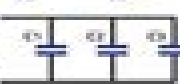
Series

$$\frac{1}{C_s} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$$



Parallel

$$C_p = C_1 + C_2 + C_3$$

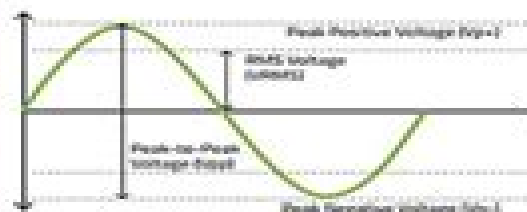


Unit Prefixes

tera	T	$\times 10^{12}$	milli	m	$\times 10^{-3}$
giga	G	$\times 10^9$	micro	μ	$\times 10^{-6}$
mega	M	$\times 10^6$	nano	n	$\times 10^{-9}$
kilo	k	$\times 10^3$	pico	p	$\times 10^{-12}$
hecto	h	$\times 10^2$			
deka	da	$\times 10^1$			
base					
deci	d	$\times 10^{-1}$			
centi	c	$\times 10^{-2}$			

Example:
 $25 \mu A = 25 \times 10^{-6} A = 0.000025 A$
 $10 \text{ mV} = 10 \times 10^{-3} V = 0.01 V$

Alternating Current



$$\text{Average AC Voltage} = 0.637 \times V_{peak} = 0.707 \times V_{avg}$$

$$\text{RMS AC Voltage} = 0.707 \times V_{peak} = 1.414 \times V_{avg}$$

$$\text{Peak AC Voltage} = 1.414 \times V_{avg} = 0.707 \times V_{peak}$$

Basic Electronics Theory

Delton T. Horn



Basic Electronics Theory:

Basic Electronics Harold D. Holbrook, Walter J. Seeley, 2013-10-22 Basic Electronics is an elementary text designed for basic instruction in electricity and electronics. It gives emphasis on electronic emission and the vacuum tube and shows transistor circuits in parallel with electron tube circuits. This book also demonstrates how the transistor merely replaces the tube with proper change of circuit constants as required. Many problems are presented at the end of each chapter. This book is comprised of 17 chapters and opens with an overview of electron theory followed by a discussion on resistance inductance and capacitance along with their effects on the currents flowing in circuits under constant applied voltages. Resistances inductances and capacitances in series and parallel are considered. The following chapters focus on impedance and factors affecting impedance electronics and electron tubes semiconductors and transistors basic electronic circuits and basic amplifier circuits. Tuned circuits basic oscillator circuits and electronic power supplies are also described together with transducers antennas and modulators and demodulators. This monograph will serve as background training in theory for electronic technicians and as fundamental background for students who wish to go deeper into the more advanced aspects of electronics. *Basic Electronics Theory* Delton T. Horn, 1981 *Basic Electronics* J. A. Sam Wilson, Milton Kaufman, 1977

Basic Electronics Theory--with Projects & Experiments Delton T. Horn, 1981 *Basic Electronics* Sean Westcott, Jean Riescher Westcott, 2023-05-24 Designed for both the student and hobbyist this updated revision is an introduction to the theory and practice of electronics including advances in microcontrollers sensors and wireless communication. Each chapter contains a brief lab to demonstrate the topic under discussion then moves on to use all of the knowledge mastered to build a programmable robot. New material on using Raspberry Pi and Python has been included. The companion files include short videos of the labs soldering skills and code samples for programming the robot. Covering both the theory and also its practical applications this text leads the reader through the basic scientific concepts underlying electronics building basic circuits learning the roles of the components the application of digital theory and the possibilities for innovation by combining sensors motors and microcontrollers. It includes appendices on mathematics for electronics a timeline of electronics innovation careers in electronics and a glossary. Features Includes companion files with over twenty video tutorials on currents soldering power supply resistors decoder circuits Raspberry Pi animations of featured circuits and more files available from the publisher for downloading. Features chapters on using Raspberry Pi and Python in electronic projects and a chapter on Cybersecurity and the Internet of Things IoT for Electronic Projects. Leads the reader through an introductory understanding of electronics with simple labs and then progresses to the construction of a microcontroller driven robot using opensource software and hardware. Basic Electronics Theory--with Projects and Experiments Delton T. Horn, 1989 *Basic Electronics* Adi Oktavianto, A. Agus Tjahjono, Pambudi W, This book is compiled based on the curriculum therefore the additional explanation relating to the question needs to be added in the classroom. Basic knowledge about

electronics is necessary for cadets especially for engineering study programs as their preparation before undergoing sea practice at merchant ship if they face some electronic equipment they will be familiar and able to analyze the problem principally if there is any fundamental problem In preparing provision mastery of basic electronics theory it also needs support skills lessons at the laboratory such as practice In compiling this book we have divided it into seven chapters and each chapter has different loading material so that one chapter needs one two time meeting allocation

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Basic Electrical and Electronics Engineering S. K. Bhattacharya,2011 This book provides an overview of the basics of electrical and electronic engineering that are required at the undergraduate level Efforts have been taken to keep the complexity level of the subject to bare minimum so that the students of non electrical electronics can easily understand the basics It offers an unparalleled exposure to the entire gamut of topics such as Electricity Fundamentals Network Theory Electro magnetism Electrical Machines Transformers Measuring Instruments Power Systems Semiconductor Devices Digital Electronics and Integrated Circuits

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Basic Electronics United States. Bureau of Naval Personnel,1962

The 1980 Guide to the Evaluation of Educational Experiences in the Armed Services: Army

American Council on Education,1980 **The 1984 Guide to the Evaluation of Educational Experiences in the Armed Services** American Council on Education,1984 **Beginning Analog Electronics through Projects** Andrew Singmin,2001-02-15 Analog electronics is the simplest way to start a fun informative learning program Beginning Analog Electronics Through Projects Second Edition was written with the needs of beginning hobbyists and students in mind This revision of Andrew Singmin s popular Beginning Electronics Through Projects provides practical exercises building techniques and ideas for useful electronics projects Additionally it features new material on analog and digital electronics and new projects for troubleshooting test equipment Published in the tradition of Beginning Electronics Through Projects and Beginning Digital Electronics Through Projects this book limits theory to need to know information that will allow you to get started right away without complex math Commonly used electronic components and their functions are described briefly in everyday terms Ideal for progressive learning each of the projects builds on the theory and component knowledge developed in earlier chapters Step by step instructions facilitate one s learning of techniques for component identification soldering troubleshooting and much more Includes instructions for using a general purpose assembly board Practical enjoyable useful approach to learning about electronics Features twelve easy and useful projects designed to familiarize beginners and hobbyists with the most commonly used ICs **FCS Electronics L2** ,2007 *The 1984 Guide to the Evaluation of Educational Experiences in the Armed Services* ,1984 [Guide to the Evaluation of Educational Experience in the Armed Service](#) 76 American Council on Education,1977 *The 1980 Guide to the Evaluation of Educational Experiences in the Armed Services: Coast Guard, Marine Corps, Navy, Dept. of Defense* American Council on Education,1980 **Guide to the Evaluation of Educational Experiences in the Armed Services** American Council on Education,1978

[Beginning Arduino Programming](#) Brian Evans,2011-12-17 Beginning Arduino Programming allows you to quickly and intuitively develop your programming skills through sketching in code This clear introduction provides you with an understanding of the basic framework for developing Arduino code including the structure syntax functions and libraries needed to create future projects You will also learn how to program your Arduino interface board to sense the physical world to control light movement and sound and to create objects with interesting behavior With Beginning Arduino Programming you ll get the knowledge you need to master the fundamental aspects of writing code on the Arduino platform even if you have never before written code It will have you ready to take the next step to explore new project ideas new kinds of hardware contribute back to the open source community and even take on more programming languages

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