

Text Book of

BASIC ENGINEERING

(CIVIL AND MECHANICAL)

For

Second Year Diploma – Semester III
Diploma in Electrical Engineering
(ELE 305)

As Per New Syllabus of SBTE, Jharkhand University

Vinod Thombre - Patil

*B.E. Mechanical, M.Tech. (Energy Technology)
Vice Principal and Head of Department – Mechanical,
S.H. Jondhale Polytechnic, Dombivali,
Dist. Thane, Maharashtra.*

Assisted by

Apeksha Vinod Thombre - Patil

*B.E., M.E. (Electronics and Telecommunication),
Assistant Professor,
G.V. Acharya College of Engineering and Technology,
Shelu, Dist. Thane, Maharashtra.*

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Dedication ...

In the loving memory of my Father,

**Late Mr. S. T. Thombre – Patil,
Hon'ble Advocate, Jalna**

Thanks,

To My Beloved Son,

“Abhishek Vinod Thombre - Patil”

Preface ...

I am glad to present the book entitled “**Basic Engineering**” for **IInd Year (Third Semester)** **Diploma in Electrical Engineering** as per SBTE’s New Revised syllabus.

I have observed the students facing extreme difficulties in understanding the basic principles and fundamental concepts. To meet this basic requirement of students, sincere efforts have been made to present the subject matter with frequent use of figures.

I am thankful to Publisher Mr. Dineshbhai Furia, Mr. Pradeepbhai Furia, Mr. Jigneshbhai Furia and Staff of Nirali Prakashan specially Mr. Shashikant Patel, Mrs. Manasi Pingle, Mr. Iliyas Shaikh, Mrs. Anjali Muley, Mr. Ravindra Walodare for bringing this publication timely to the Market.

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I specially thank my students for motivating and encouraging me from time to time.

Any errors or suggestions for the improvement of this book brought to notice will be thankfully acknowledged and incorporated in the next edition.

Vinod Thombre - Patil

Syllabus ...

Chapter 1 : Basic Civil Engineering Materials

[5 Hours]

- 1.1 Basic Knowledge of Civil Engineering Materials like Sand, Cement, Bricks, Tiles, Terra Coat, Lime, Mortar Concrete, Paints and Varnishes.

Chapter 2 : Timber

[3 Hours]

Type and Structure of Timber Tree, Defects in Timber, Characteristics of Good Timber, Seasoning of Timber.

Chapter 3 : Surveying and Levelling

[8 Hours]

Surveying Instruments, Measurements of Horizontal Distance by Chain. Measurement of Horizontal and Vertical angle. Basic Knowledge of Levelling and Total Station.

Chapter 4 : Foundations for Machines

[3 Hours]

- 4.1 Fundamental of Mechanical Vibration
- 5.2 Need for Foundation
- 5.3 Material Required for Foundation
- 4.4 Foundation Battz and Sizes.
- 4.5 Crilina for Design

Chapter 5 : Joints and Fabrications

[2 Hours]

Types of Joints, Necessary Precautions for Working with Metals, Fabrication Process Concept.

Chapter 6 : I.C. Engine

[4 Hours]

- 6.1 Construction and Working of Two Stroke and Four Stroke Petrol and Diesel Engine.
- 6.2 Reasons of Mal functioning and Remedial Measurement for I.C. Engine

Chapter 7 : Boilers

[9 Hours]

- 7.1 Construction and Working of Cochran, Babcock and Wilcox Boilers **[2 Hours]**
- 7.2 Construction and Working Principle with Velocity Diagram of Impulse and Reaction Turbine **[5 Hours]**

- 7.3 Construction and Working Principle of Steam Turbine. **[2 Hours]**

Chapter 8 : Introduction to Thermodynamics

[4 Hours]

1st and 2nd Laws of Thermodynamics. Basic Knowledge of Enthalpy, Entropy etc.

Chapter 9 : Pumps and Air Compressors

[4 Hours]

- 9.1 Types of Pumps - Centrifugal Pump, Reciprocating Pump, Their Function. **[2 Hours]**
 - 9.2 Air Compressors, Classification of Compressors, Construction and Working of Single and Two Stage Reciprocating Compressors. **[2 Hours]**
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