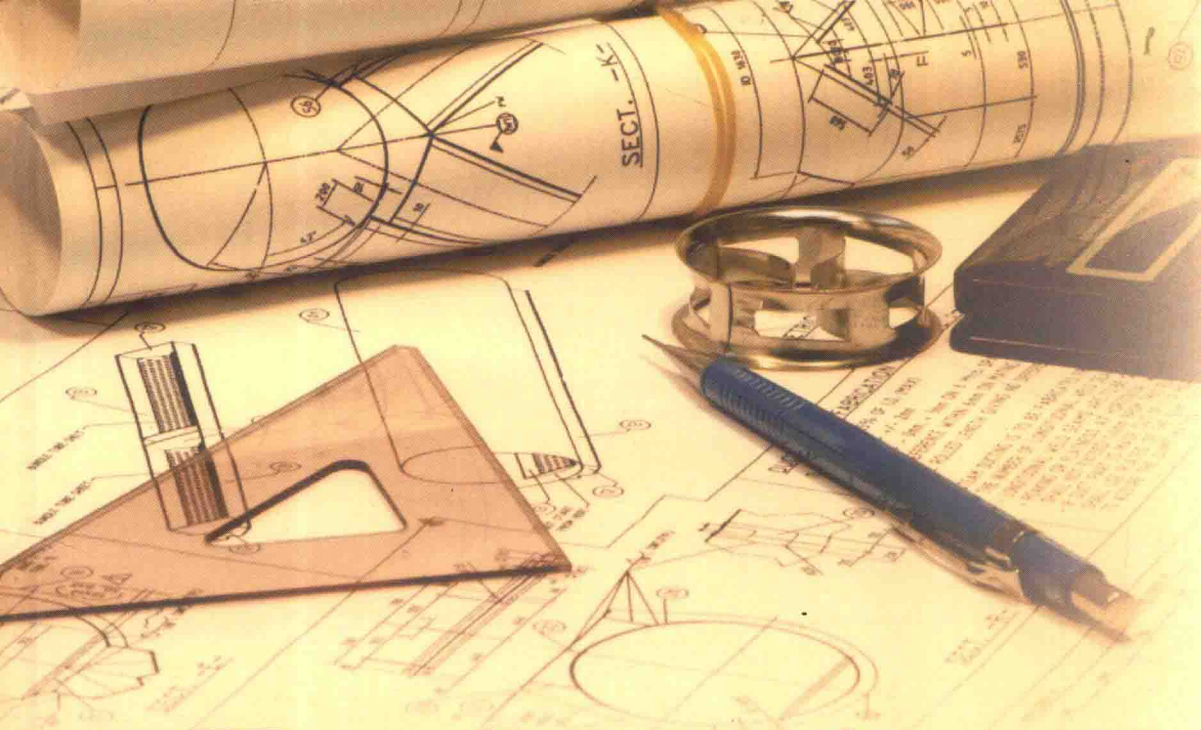


A detailed illustration of engineering drawing tools and blueprints. At the top, a rolled-up blueprint is partially unrolled, showing technical drawings and the text 'SECT. - y -'. Below it, a wooden set square is placed on a blueprint. To the right, a blue ballpoint pen and a metal compass are visible. The background is filled with various engineering drawings, including a circular cross-section and a perspective view of a mechanical part.

Engineering Graphics

Fourth Edition

A.M. Chandra • Satish Chandra



Alpha Science

Engineering Graphics

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A. M. Chandra
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Engineering Graphics

Fourth Edition

Preface to the Fourth Edition

Some important topics such as *Projection on Auxiliary Planes* and *dividing an arc in to equal number of parts* were introduced in the third edition of the book. Authors feel that the readers must have been benefitted by these topics in understanding the projections on different planes, and also they must have found that these new topics are use useful in obtaining the true lengths, true angles and true angles and true shapes of the objects. In the previous edition of the book, an important chapter on *Projection of Lines* was added as an appendix. It has now been brought back to its proper place. This edition of the book has been thoroughly revised and some new problems have been added in the Chapters 2 and 6.

A. M. Chandra
Satish Chandra

Preface to the First Edition

It is well known that technical drawing is the language of engineering and the people engaged in engineering profession must have good knowledge of drawing for design and construction of any engineering project. Realizing this aspect, the Thomson College of Engineering, established in 1847 (now the University of Roorkee), the first of its kind in Asia and the British Empire and one of the first in the world, had a separate department for teaching of surveying and drawing. The students at this college and elsewhere are required to undergo extensive training in these two disciplines of civil engineering. The authors felt that there is a great need of a text book which explains the principles and construction of engineering graphics in an elementary manner so that the readers belonging to different cross sections of engineering can understand it with a minimum effort. Readers may find the explanations unnecessarily detailed at some places for which no apology is offered as the book is basically for the beginners of the engineering curriculum, both at degree and diploma level, including AMIE courses. It covers the syllabi in engineering drawing followed in most of the engineering institutes of the country.

The authors have introduced some conventions of designating the planes, ground lines, projections on the planes and rotations of the planes to avoid confusions and to make the things simpler in obtaining the projections. The final projections remain as per the standard conventions and, therefore, are not affected in any manner by adopting the new conventions introduced in this book.

Numerous illustrations with detailed step-by-step constructional procedure are provided to make the subject more lucid. The material compiled in this book has been class tested and finalized after several years of teaching by the authors.

In spite of the fact that every care has been taken, some errors might have remained. The authors will feel obliged for any such intimation by the readers to rectify them in the subsequent editions. Constructive suggestions and comments for further improvement, will be gratefully acknowledged.

A. M. Chandra
Satish Chandra

Abbreviations, Symbols and Notations

ABBREVIATIONS

HP	Horizontal Plane
VP	Vertical Plane
IP	Inclined Plane
AVP	Auxiliary Plane
OP	Oblique Plane
PP	Profile Plane
GL	Ground Line
TL	True Length
TS	True Shape
VT	Vertical Trace
HT	Horizontal Trace
VTH	Vertical and Horizontal traces of a Plane
SD	Shortest Distance

SYMBOLS

θ	Inclination of a line with the HP
ϕ	Inclination of a line with the VP
α	Inclination of a plane with the HP
β	Inclination of a plane with the VP
ξ	Inclination of VT of a plane with the GL
η	Inclination of HT of a plane with the GL
ω	Dihedral angle (angle between two planes)
$\textcircled{H}, \textcircled{J}$	Planes named H and J
$\textcircled{V}/\textcircled{H}$	GL or intersection line of planes V and H

NOTATIONS

a_H, a_J	Projections of point A on planes H and J
h_t	Horizontal trace
v_t	Vertical trace

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