

# Information and Communication Technology

Textbook for Class IX



977

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी  
NCERT

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्  
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

ISBN 978-93-5292-118-8

**First Edition**

February 2019 Magha 1940

**PD 5T BS**

© **National Council of Educational  
Research and Training, 2019**

₹ 140.00

Printed on 80 GSM paper with NCERT  
watermark

Published at the Publication Division  
by the Secretary, National Council of  
Educational Research and Training,  
Sri Aurobindo Marg, New Delhi 110 016  
and printed at Gita Offset Printers (P.)  
Ltd., C-90 & C-86, Okhla Industrial  
Area, Phase-I, New Delhi - 110020

**ALL RIGHTS RESERVED**

- ❑ No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.
- ❑ This book is sold subject to the condition that it shall not, by way of trade, be lent, re-sold, hired out or otherwise disposed off without the publisher's consent, in any form of binding or cover other than that in which it is published.
- ❑ The correct price of this publication is the price printed on this page. Any revised price indicated by a rubber stamp or by a sticker or by any other means is incorrect and should be unacceptable.

**OFFICES OF THE PUBLICATION  
DIVISION, NCERT**

NCERT Campus  
Sri Aurobindo Marg  
New Delhi 110 016 Phone : 011-26562708

108, 100 Feet Road  
Hosdakere Halli Extension  
Banashankari III Stage  
Bengaluru 560 085 Phone : 080-26725740

Navjivan Trust Building  
P.O. Navjivan  
Ahmedabad 380 014 Phone : 079-27541446

CWC Campus  
Opp. Dhankal Bus Stop  
Panihati  
Kolkata 700 114 Phone : 033-25530454

CWC Complex  
Maligaon  
Guwahati 781 021 Phone : 0361-2674869

**Publication Team**

Head, Publication Division : *M. Siraj Anwar*  
Chief Editor : *Shveta Uppal*  
Chief Production Officer : *Arun Chitkara*  
Chief Business Manager : *Abinash Kullu*  
Editor : *Bijnan Sutar*  
Production Assistant : *Rajesh Pippal*

**Cover and Layout**

*Graphics Team, CIET*

## FOREWORD

Information and Communication Technology (ICT) has influenced our life in a great way. ICT has literally made inroads into almost all major disciplines across science, social sciences, languages, arts and medicine, etc. It has the potential to create newer avenues for employment, help us communicate and collaborate better, learn, and understand the nature and phenomena as well as improve our skills and standards of living. Policymakers across the globe today agree with the potential of ICT in the teaching-learning process and recommend ICT to be a part of school and teacher education curriculum.

Rapid advancements in Information and Communication Technology (ICT) have created unprecedented opportunities in the field of education and school education in particular. Mastering ICT skills and utilising ICT is of utmost importance for teachers and learners for creating a new learning culture.

ICT is stated to have motivational power. It enables students to enjoy learning as an active participant, such as by bringing the outside world into the classroom or by enhancing one-to-one, one-to-many and many-to-many interaction, among peers, teachers, experts and others. Furthermore, ICT has also helped the students in learning new skills, such as searching and locating appropriate information, making informed choices, learning to recognise the authenticity of sources and collaborating with other learners.

Today, we are living in an interconnected world where ICT-based applications influence the way we learn, communicate, commute or even socialise. Developments in the twenty-first century skills, such as communication, creative and critical thinking, problem solving, collaborative learning, etc., are essential at the school level. ICT plays a key role in developing these skills.

This book aims to introduce the world of ICT and its applications. It will help students to learn, prepare, present and communicate their thoughts, ideas and content through various digital formats, i.e., text, image, audio and video, etc.

The book will also help students to understand the potential of Internet as well as the safety and security issues related to it, and the ways in which one can safeguard themselves against malicious activities and incidents happening in the cyber world.

As an organisation committed to systemic reform and continuous improvement in the quality of its products, NCERT welcomes comments and suggestions from all the stakeholders, which will enable us to revise the content of the textbook.

HRUSHIKESH SENAPATY

*Director*

New Delhi  
*March, 2018*

National Council of Educational  
Research and Training

© NCERT  
not to be republished

## PREFACE

It is well accepted that Information and Communication Technology (ICT) has an immense potential to impact learning. Also understanding the basics of ICT and mastering the skills is essential and must be regarded as a core part of education, along with reading, writing and numeracy. The recent efforts of the Government of India (GoI) seeks to deepen the use of ICT in almost every sphere of life. The Digital India Campaign (2015) strives to transform India into a digitally empowered society and knowledge economy by focussing on three vision areas — Digital Infrastructure as Core Utility to Every Citizen, e-Governance and Service on Demand and Digital Literacy and Empowerment of Citizens. The three cardinal principals of the draft New National Education Policy (2016) viz., access, equity and quality could be served well by harnessing the huge potential of ICT. The National Curriculum Framework (2005) recommends to recognise that given the space, time and freedom, children generate new knowledge by engaging with the information passed on to them by adults. The curricula for ICT in education lays an emphasis on empowering the students in a way so that they may get an access to a variety of resources, learn to critically appraise information and resources, and make safe, productive, ethical and legal use of resources.

The Present Class IX Textbook of ICT takes into account goals of the New Education Policy, the recommendations of National Curriculum Framework (2005), the Curricula for ICT in Education and visions of Digital India Campaign (2015). This textbook is an attempt to foster creativity, problem solving and to introduce students to the world of Information and Communication Technology (ICT), which may also shape their future career pursuits.

The textbook contains eight chapters under four learning strands viz. 'Connecting with the World', 'Connecting with Each Other', 'Creating with ICT' and 'Interacting with ICT'. It has been carefully designed with meticulous efforts of the Textbook Development Team comprising School teachers, subject experts, academicians and technical experts from government, non-government and private entities. Some of the members worked at the advisory level while others contributed towards the actual development activity as core team members and members of the textbook development committee. It is hoped that the students will appreciate the immense potential of ICT and will be encouraged to explore and learn further. The textbook writing team has tried to bring a conceptual

coherence. The pedagogy and the use of easily understandable language are at the core of the efforts without sacrificing the technical aspects of the subject.

This book has some features which are earnestly expected to enhance its usefulness for the students and teachers. The book contains nine Quick Response (QR) codes linked to relevant digital resources (text, audio, video, and interactive content, etc.). The first QR code is to access the complete digital textbook. The subsequent QR codes will help to access the relevant digital resources linked to each chapter. There are some questions which require critical thinking which would make students think about real-time applications of ICT. The textbook also includes a large number of examples in order to clarify the concept and to relate these concepts to everyday real-life situations. The inside box in the chapters are introduced to highlight the special features of the concepts covered, which require additional attention of the students.

Completion this book has only been possible due to the continuous support of many professionals and experts. We express our gratitude to Director, NCERT, for entrusting us with the task of developing this textbook as part of a national effort for improving school education.

The draft received excellent academic inputs from students, experts and other practitioners who sincerely suggested improvement during the development of this book. We are thankful to all those who provided these inputs to CIET, NCERT. We are also thankful to all the members of development and review workshops, language editors and to team DIKSHA for rendering technical support for developing QR codes.

We welcome suggestions and comments from our valued users, specially students and teachers. We wish our young readers of Class IX have an exciting and enjoyable engagement with the world of ICT.

AMARENDRA BEHERA

*Joint Director*

Central Institute of Educational Technology

## TEXTBOOK DEVELOPMENT COMMITTEE

### CHAIRPERSON, ADVISORY GROUP

A. P. Behera, *Professor and Joint Director*, Central Institute of Educational Technology, NCERT

### MEMBERS

Aerum Khan, *Freelancer*, E-210, Shaheen Bagh, Jamia Nagar, New Delhi

Ajita, *Assistant Professor*, DICT&TD, CIET, NCERT

Angel Rathnabai, *Assistant Professor*, DICT&TD, CIET, NCERT

Anu Bhatia, *PGT*, Computer Science, Sadhu Vaswani International School for Girls, Shanti Niketan, New Delhi

Chetna Khanna, *Freelancer*, F-40, Mansarovar Garden, New Delhi

Dharmender Singh, *PGT*, Computer Science, KVS, INA Colony, New Delhi

Indu Kumar, *Head*, DICT&TD, CIET, NCERT

Meetu Singhal, *PGT*, Computer Science, Kendriya Vidyalaya No.3, Agra cantt., Agra

Mohini Arora, *HOD*, Computer Science, Air Force Golden Jubilee Institute, Subroto Park, Delhi Cantt

Sangeeta Rawal, *PGT*, Computer Science, Delhi Public School, Vasant Kunj, New Delhi

Sangita Chadha, *Head*, Department of Computer Science, Ambience Public School, Safdarjung Enclave, New Delhi

Surbhi, *Assistant Professor*, DICT&TD, CIET, NCERT

Vineeta Garg, *PGT*, Computer Science, SRDAV Public School, Dayanand Vihar, New Delhi

### MEMBER-COORDINATOR

Mohd. Mamur Ali, *Assistant Professor*, DICT&TD, CIET, NCERT

## ACKNOWLEDGEMENTS

The National Council of Educational Research and Training (NCERT) gratefully acknowledges the valuable contribution of individuals and organisations involved in the development of the textbook *Information and Communication Technology (ICT)* for Class IX.

The Council expresses its gratitude to the syllabus developing team including Sridher Iyer, *Professor*, Department of Computer Science and Engineering, IIT Mumbai, I. L. Narasimha Rao, *Project Manager*, C-DAC, Hyderabad, Radhika B., *Academic Officer (ICT)*, National Institute of Open Schooling (NIOS), Noida, Ashish Kalsi, *India Outreach Lead, Trust & Safety*, Google India and Rejaul Karim Barbhuiya, *Assistant Professor*, DESM, NCERT.

The Council acknowledges the contribution of Gurumurthy Kasinathan, *Director*, IT for Change, Bengaluru, Devraj Goel, *Professor (ET)*, CIET, NCERT, Asha Jindal, *Professor (Retd)*, Kamlesh Mittal, *Professor (Retd)*, M. P. Goel and Ramya Shriram, *Teachers (Computer Science)*, Meridian School K.P.H.B., Hyderabad, Ramesh Prasad Badoni (ICT Awardee) *Lecturer*, Physics, Government Inter College, Dehradun, Monica Nagpal, *Assistant Professor*, CIET, NCERT, for going through the first draft of the textbook and making incisive comments on the manuscript.

The Council also acknowledges the reviewers — Anamika Gupta, *Assistant Professor*, Department of Computer Science, Shaheed Sukhdev College of Business Studies, Rohini, New Delhi, Harita Ahuja, *Assistant Professor*, Department of Computer Science Acharya, Narendra Dev College, Kalkaji, New Delhi, Gurpreet Kaur, *Head*, Department of Computer Science, G.D. Goenka Public School, Vasant Kunj, Delhi and A. K. Dash, *PGT*, Computer Science–Mother's International School, Adhchini, New Delhi, for evaluating and giving suggestions for the improvement of this book.

Silima Nanda, *Director (I/C)*, International Division, IGNOU, New Delhi and Anuja Krishan, *Language Editor (Freelancer)*, New Delhi are also duly acknowledged for editing this textbook.

The Council also acknowledges the contribution of the graphics artists Tarkeshwar Gupta, Chandramauli Shukla, Divya Talwar, Insha Humzad Afridi, Gaurav Gupta and project staff of DICT, Ruchi Sharma and Shobit Saxena in shaping this book. The Council acknowledges the copy editing of Shilpa Mohan, *Assistant Editor (Contractual)*. The efforts of Haridarshan Lodhi, *DTP Operator (Contractual)*, Publication Division, NCERT, are also acknowledged.



## CONTENTS

|   |            |
|---|------------|
| <i>Foreword</i>                                   | <i>iii</i> |
| <i>Preface</i>                                    | <i>v</i>   |
| Chapter 1: Introduction to ICT                    | 01–13      |
| Chapter 2: Creating Textual Communication         | 14–38      |
| Chapter 3: Creating Visual Communication          | 39–56      |
| Chapter 4: Creating Audio-Video Communication     | 57–69      |
| Chapter 5: Presenting Ideas                       | 70–77      |
| Chapter 6: Getting Connected: Internet            | 78–92      |
| Chapter 7: Safety and Security in the Cyber World | 93–101     |
| Chapter 8: Fun with Logic                         | 102–122    |

# THE CONSTITUTION OF INDIA

## PREAMBLE

**WE, THE PEOPLE OF INDIA**, having solemnly resolved to constitute India into a <sup>1</sup>**[SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC]** and to secure to all its citizens :

**JUSTICE**, social, economic and political;

**LIBERTY** of thought, expression, belief, faith and worship;

**EQUALITY** of status and of opportunity; and to promote among them all

**FRATERNITY** assuring the dignity of the individual and the <sup>2</sup>[unity and integrity of the Nation];

**IN OUR CONSTITUENT ASSEMBLY** this twenty-sixth day of November, 1949 do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

1. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Unity of the Nation" (w.e.f. 3.1.1977)