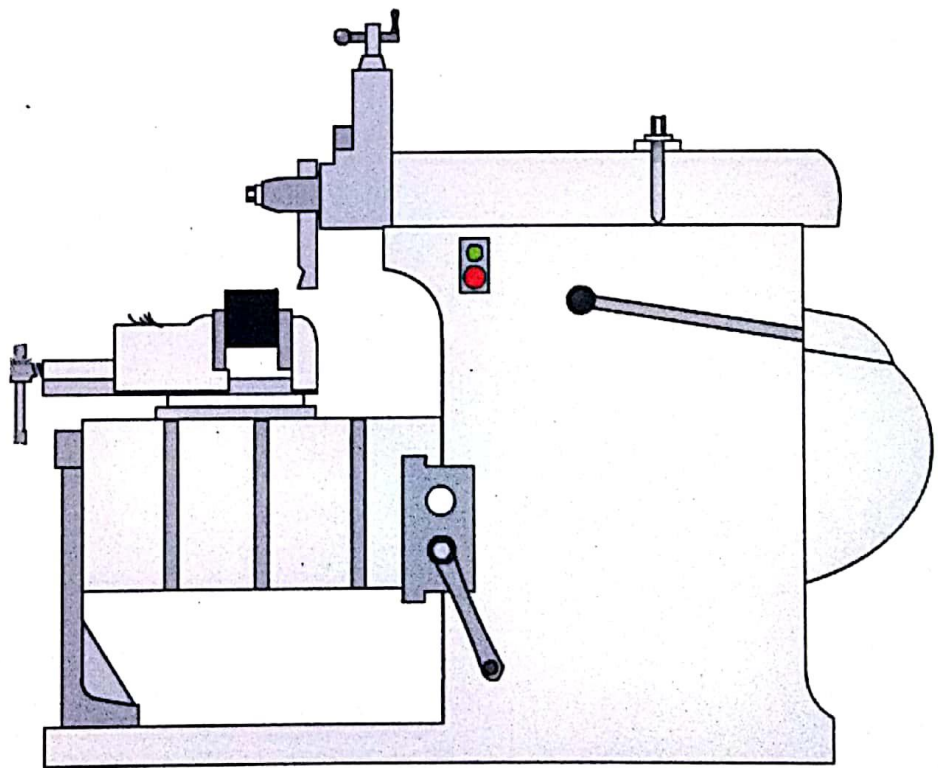
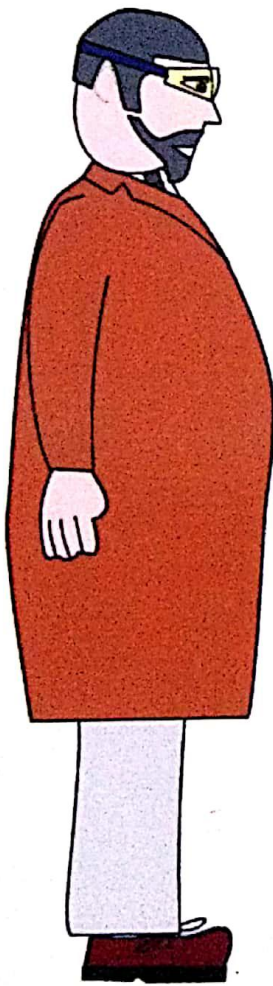


3G HANDY GUIDE: **CNC Lathe Machine Operation**



Features:

- ▶ Interactive Activities, question and quizzes
- ▶ Compelling visual examples, case studies and graphic design
- ▶ Easily customisable learning content and assessments



3G E-LEARNING

3G HANDY GUIDE: CNC LATHE MACHINE OPERATION



3G E-LEARNING

3G HANDY GUIDE: CNC LATHE MACHINE OPERATION



3G E-LEARNING

© 2019 3G E-learning LLC

90 Church Street

FL 1 #3514

New York, NY 10008

United States of America

www.3ge-learning.com

email: info@3ge-learning.com

Authored and Edited by 3G E-learning LLC, USA

ISBN: 978-1-98462-563-2

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, scanning or otherwise without prior written permission of the publisher.

This book contains information obtained from highly regarded resources. A Wide variety of references are listed. Reasonable efforts have been made to publish reliable data and information, but the authors, editors, and the publisher cannot assume responsibility for the legality of all materials or the consequences of their use. The authors, editors, and the publisher have attempted to trace the copyright holders of all material in this publication and express regret to copyright holders if permission to publish has not been obtained. If any copyright material has not been acknowledged, let us know so we may rectify in any future reprint. Registered trademark of products or corporate names are used only for explanation and identification without intent to infringe.

Notice: Registered trademark of products or corporate names are used only for explanation and identification without intent of infringement. Case Studies and/or Images presented in the book are the proprietary information of the respective organizations, and have been used here specifically and only for educational purposes. Although care has been taken to check accuracy of formulas and procedures, the detailed methods should be tested further on a small scale before being adopted commercially.

For more information visit about 3G E-Learning LLC and its products, visit www.3ge-learning.com

TABLE OF CONTENTS

Preface	ix
Chapter 1 Computer Numerical Control (CNC)	1
Overview Of Computer Numerical Control (CNC).....	3
CNC Machines	6
Types of CNC Machines	11
Retrofitted Machines	11
Milling Machines	12
Lathes	13
Grinders	13
Custom-Built Machines	14
CNC Router	14
3-D Printer	15
Metrology Machines.....	17
Knowledge Check.....	19
Reference.....	22
Chapter 2 Lathe Machine	23
Metal Lathe	25
Headstock	27
Bed.....	28
Feed and lead screws	28
Carriage.....	30
Types of Metal Lathes	40
Center lathe.....	40
Capstan (Ram-type) lathe.....	41
Turret (Saddle-type) lathe.....	41
Multispindle lathe	42
Combination lathe	43
CNC lathe / CNC Turning Center	44

Swiss Style Lathe / Swiss Turning Center	45
Accessories.....	45
Drill.....	48
Knowledge Check.....	56
References	59

Chapter 3 Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM) 61

Computer Aided Manufacturing	63
Different Types of Computer-Aided Manufacturing	66
Computer Aided Manufacturing Applications.....	69
History	72
The Disadvantages of Computer Aided Manufacturing	73
CAD to CAM Process.....	76
CNC Machines at a Glance.....	78
CNC Routers	79
Water, Plasma & Laser Cutters	81
Milling Machines	82
Lathes.....	82
Electrical Discharge Machines (EDM)	83
The Human Element of CAM.....	86
The Impact of CAM.....	88
Benefits of CAM.....	89
Early career	91
Banking standard.....	91
Business.....	92
Knowledge check.....	93
Reference.....	96

Chapter 4 Tools and Equipment 97

Cutting Tools	99
Tool materials	99
Special Types of Lathe Cutting Tools.....	112
Tool Holders and Tool Posts	116
Benefits of the management system.....	122
Knowledge Check.....	124
References	127

Chapter 5	Turing Machine	129
	Overview Of Turing Machine	131
	Computable	138
	Turing Machine Example Programs	142
	Impact of Turing Machines on Computer Science	150
	Impact on Theoretical Computer Science	150
	Turing Machines and the Modern Computer.....	151
	Theories of Programming.....	154
	Knowledge Check.....	161
	Reference.....	164
 Chapter 6	 Milling Machine	 165
	Basic Concept of Milling Machine.....	167
	Types of milling machine	171
	Column and knee type milling machine.....	171
	Vertical milling machine.....	172
	Horizontal milling machine	173
	Fixed bed milling machine.....	177
	Planner milling machine.....	179
	Special milling machine.....	179
	Milling Machine Operation.....	183
	Plain milling	183
	End milling	185
	Gang milling.....	186
	Straddle milling:	187
	Slotting	187
	Angular milling.....	188
	Knowledge Check.....	192
	References	195
 Index		 197

INDEX

Symbols

3-D Printer 15
3-State Busy Beaver 145

B

Binary Counter 142

C

CAD program 4
Carbon steel 100
Cast alloys 105
Cast steel 105, 106
CNC milling machine 170, 180
Computable 138, 157
Computational complexity theory 150, 151
Computer aided design (CAD) 64, 69
Computer Aided Manufacturing (CAM) 69
Computer numerical control (CNC) 1
Computer numerical control machines 5
computer programming 11
Crucible steel 105

D

drill press 31, 32
Duplex milling machine 178

E

EDVAC design 151
Electrically conductive 81, 83
End milling 185

F

Feeds crew 25, 28, 30
finite state machine 133, 134, 135, 137, 138
Fixed bed milling machine 177

G

Gang milling 186
G-Code 7
Grinders 13, 21

H

halting problem 138, 140, 141
Headstock 25, 27, 28, 46, 47
High speed steel 103, 104
Horizontal milling machine 173
Hot isostatic pressing (HIP) 107

I

irregular surfaces 169

K

knee type milling machine 171, 192

L

Lathe cross slides 32

M

Machine control unit (MCU) 1
Manufacturers 100, 101
Mechanical industries 171
Metal-cutting tools 99
Metalworking industry 167
Metrology Machines 17
Milling machines 167, 169, 173, 194
Milling machines and drill presses 31
Multi-tasking machines (MTMs) 165

N

Non-computable numbers 141

P

Palindrome Detector 147
Planner milling machine 179
plasma cutters 6, 14
Precision machine tools 31

Q

Quantum Turing machines 133

R

Resource Management 64
Retrofitted Machines 11

S

screw threads 29, 54, 55
Simplex milling machine 178
Slotting 187

T

Three-jaw chuck 48, 50
Tool materials 99
Toolpost 35
Torque 185
Tracer milling machine 180
Turing machine 129, 131, 132, 133, 134,
135, 136, 137, 138, 139, 140, 141,
145, 150, 151, 152, 153, 154, 155,
162, 163
Turning and boring 99

U

Unary Subtraction 143
Universal Turing machine 137, 138, 141,
161

V

Vertical milling machine 172