Appendix L: Resources

Contents

Appendix L: Recommended Reading and Resources

L.1 Essential Books

L.1.1 CNC Fundamentals

Title	Author(s)	Publisher	Year	Focus
CNC Programming Handbook (3rd Ed.)	Peter Smid	Industrial Press	2007	G-code, programming, comprehensive reference
Machinery's Handbook (31st Ed.)	Erik Oberg et al.	Industrial Press	2020	Machining data, materials, processes (Bible of machining)
CNC Control Setup for Milling and Turning	Peter Smid	Industrial Press	2010	Machine setup, work offsets, tool management
Build Your Own CNC Machine	James Floyd Kelly	Que	2009	DIY CNC construction, beginner-friendly
Desktop CNC Machining	James Floyd Kelly	Que	2015	Small CNC routers, hobbyist projects

L.1.2 Mechanical Design and Motion Control

Title	Author(s)	Focus
Precision Machine Design	Alexander H. Slocum	MIT, error budgeting, kinematic design principles
Machine Design: An Integrated Approach (6th Ed.)	Robert L. Norton	Mechanical components, shafts, bearings, gears
Linear Motion Tips	Thomson Industries	Linear guides, ball screws, selection guide (free PDF)
The Way Things Work	David Macaulay	Mechanisms explained visually (excellent for understanding basics)

L.1.3 Electronics and Control Systems

Title	Author(s)	Focus
Practical Electronics for Inventors (4th Ed.)	Paul Scherz, Simon Monk	Circuits, motors, sensors, microcontrollers
Understanding PLC Programming	Festo Didactic	Industrial control, ladder logic
Step and Direction Motor Control	Douglas W. Jones	Stepper motor theory, control methods
Electric Motors and Drives (5th Ed.)	Austin Hughes, Bill Drury	AC/DC motors, VFDs, servo systems

L.1.4 Machining and Manufacturing

Title	Author(s)	Focus
Metal Cutting Theory and Practice (3rd Ed.)	David A. Stephenson, John S. Agapiou	Cutting forces, tool wear, chip formation
Manufacturing Processes for Engineering Materials (6th Ed.)	Serope Kalpakjian, Steven Schmid	Overview of all manufacturing methods
Fundamentals of Machining and Machine Tools (3rd Ed.)	Geoffrey Boothroyd, Winston A. Knight	Traditional and CNC machining processes

---

L.2 Online Resources

L.2.1 Forums and Communities

Platform	URL	Focus	Active Users
CNCzone	cnczone.com	All CNC topics, DIY to industrial	500k+
Practical Machinist	practicalmachinist.com	Metalworking and CNC machining, professional	300k+
LinuxCNC Forum	forum.linuxcnc.org	LinuxCNC software, HAL, hardware	50k+
r/CNC (Reddit)	reddit.com/r/CNC	Projects, troubleshooting, beginner-friendly	100k+
r/hobbycnc (Reddit)	reddit.com/r/hobbycnc	DIY CNC routers, 3D printers	70k+

Platform	URL	Focus	Active Users
BuildYourCNC Forum	buildyourcnc.com/forum	DIY CNC kits, community support	20k+

L.2.2 YouTube Channels

Channel	Subscribers	Focus	Recommended For
NYC CNC	600k+	CNC milling, shop projects, tool reviews	Beginners to intermediate
Tormach	100k+	CNC mills, software tutorials, techniques	PCNC users, general CNC
This Old Tony	1.5M+	Manual machining, CNC, humor	Beginners, entertainment + education
Clickspring	1.2M+	Precision clockmaking, machining art	Inspiration, precision techniques
Abom79	800k+	Manual machining, tool grinding, repair	Traditional machining skills
Joe Pieczynski	400k+	Inspection, metrology, quality control	Measurement techniques
Winston Moy	300k+	CNC projects, tool reviews, DIY	Hobbyists, practical projects
Edge Precision	200k+	Advanced machining, CAM programming	Intermediate to advanced

L.2.3 CAD/CAM Software Tutorials

Software	Official Tutorials	Community Resources
Fusion 360	autodesk.com/products/fusion-360/learn	YouTube: Autodesk Fusion 360, Lars Christensen

Software	Official Tutorials	Community Resources
FreeCAD	wiki.freecadweb.org	YouTube: Joko Engineering, Adventures in Creation
SolidWorks	solidworks.com/support/learn	LinkedIn Learning, GrabCAD Tutorials
Inkscape (2D)	inkscape.org/learn	YouTube: Logos By Nick, TJ FREE
F-Engrave	scorchworks.com/Fengrave/fengrave.html	V-carving, engravings (free software)

L.3 Technical Datasheets and Standards

L.3.1 Free Online References

Resource	URL	Content
Engineers Edge	engineersedge.com	Formulas, conversions, material properties
Efunda	efunda.com	Engineering fundamentals, calculators
Zeus Precision Charts	zeusinc.com/reference-material	Wire gauge charts, material properties (PDF)
Machinist's Calculator	machinistcalculator.com	Feeds/speeds, thread data, bolt torque
Little Machine Shop	littlemachineshop.com/reference	Miniature machine tools, techniques

L.3.2 Standards Organizations

Organization	Focus	Access
ISO (International Organization for Standardization)	Global standards (machinery, safety)	Paid (iso.org)
ANSI (American National Standards Institute)	USA standards	Paid (ansi.org)
NIST (National Institute of Standards and Technology)	USA measurements, calibration	Free (nist.gov)
IEC (International Electrotechnical Commission)	Electrical standards	Paid (iec.ch)
NFPA (National Fire Protection Association)	Electrical codes (NFPA 79)	Paid (nfpa.org)

Free Standard Access: - Many public libraries offer free access to standards (check local library website) - University libraries (if you have alumni access)

L.4 Software and Tools

L.4.1 Free and Open-Source Software

Software	Type	Platform	Best For
LinuxCNC	CNC Control	Linux	Advanced users, custom machines
FreeCAD	3D CAD	Win/Mac/Linux	Parametric modeling, open-source projects
Inkscape	2D Vector	Win/Mac/Linux	V-carving, 2D design, laser cutting
dxf2gcode	CAM (2D)	Win/Linux	2D profiles, DXF to G-code
PyCAM	CAM (3D)	Win/Mac/Linux	3D toolpaths, STL to G-code
bCNC	G-code Sender	Win/Mac/Linux	GRBL control, simple interface
Universal Gcode Sender	G-code Sender	Win/Mac/Linux	GRBL/TinyG, real-time visualization

L.4.2 Commercial Software (Free Trials Available)

Software	Type	Trial Length	Notes
Fusion 360	CAD/CAM	Free (personal use)	Cloud-based, full-featured CAM
Vectric VCarve	CAM (2.5D)	30 days	Wood carving, sign-making
Aspire	CAM (3D relief)	30 days	Advanced 3D carving (by Vectric)
SolidCAM	CAM	30 days	Professional CAM for SolidWorks
Mastercam	CAM	Contact for demo	Industry-standard, expensive

L.5 Recommended Suppliers (Books and Resources)

Vendor	Products	URL	Notes
Industrial Press	Technical books, Machinery's Handbook	industrialpress.com	Publisher of machining references
SME (Society of Manufacturing Engineers)	Books, videos, training	sme.org	Professional development, courses
Tooling U-SME	Online training courses	toolingu.com	Structured learning paths (paid)
Amazon	All technical books	amazon.com	Often cheaper than direct publishers
ThriftBooks	Used technical books	thriftbooks.com	Budget option for older editions

---

L.6 Podcasts and Video Series

L.6.1 Podcasts

Podcast	Host(s)	Focus	Frequency
The Manufacturing Show	Multiple hosts	Industry trends, technology	Weekly
Making Chips	Jim Carr, Jason Zenger	Manufacturing stories, CNC	Weekly
The Fabricator Podcast	The Fabricator staff	Metal fabrication, cutting	Monthly

L.6.2 Documentary Series

Series	Platform	Content
How It's Made	YouTube/TV	Manufacturing processes (consumer products)
Ultimate Factories	National Geographic	Large-scale industrial manufacturing
The Secret Life of Machines	YouTube	Mechanisms explained (vintage, excellent)

L.7 Recommended Learning Path for Beginners

Phase 1: Fundamentals (Months 1-3) 1. Read: *Build Your Own CNC Machine* (James Floyd Kelly) 2. Watch: NYC CNC YouTube channel (all "CNC Basics" videos) 3. Join: CNCzone forum,

introduce yourself, read “sticky” posts 4. Software: Install FreeCAD or Fusion 360, complete online tutorials (2-3 hours/week)

Phase 2: Design and Planning (Months 3-6) 1. Read: *Precision Machine Design* (Slocum) - Chapter 1 (error budgets) 2. Design: Sketch your CNC machine concept in CAD (X/Y/Z axes, dimensions) 3. Calculate: Motor sizing using Appendix C formulas (practice problems) 4. Community: Post design for feedback on r/hobbycnc or CNCzone

Phase 3: Construction (Months 6-12) 1. Source: Order components (use Appendix K vendor list) 2. Assemble: Follow course modules (mechanical frame motion electronics) 3. Document: Take photos, keep build log (helps troubleshooting later) 4. Test: Calibrate each axis individually before full integration

Phase 4: Mastery (Ongoing) 1. Read: *Machinery’s Handbook* (reference for specific projects) 2. Practice: G-code programming (use Appendix F reference) 3. Experiment: Try different materials, cutting strategies 4. Share: Post completed projects, help others in community

---

End of Recommended Reading and Resources Appendix