



Syllabus

Volume 1	Shop Mathematics	Week 1
Unit 1	Base 10 -Decimals, Percentage	
Unit 2	Fractions	
Unit 3	Algebraic Expressions, Simple Equations, Ratio and Proportion	
Unit 4	Graphs, Charts and Data Handling	
Unit 5	Weights, Measure, and Metric Conversion	
Unit 6	Exponents, Square Roots, Right Triangles	
Unit 7	Angles, Plane Figures, Area	
Unit 8	Measurement of Solid Figures, Volume, & Intro. To Trig.	
Unit 9	Trigonometric Tables	

Volume 2	Blue Print Reading	Week 2
Unit 1	Blue Print Reading	
Volume 3	Measurement	
Unit 1	Linear Measurement	
Volume 4	Hand Tools	
Unit 1	Care and use of Hand Tools	
Unit 2	Thread Fasteners, Hole Taps, Washers, Nuts, Retaining Rings, & Small Rivets	
Volume 5	Basic Mechanical Components	
Unit 1	Basic Machines	
Unit 2	Shafts, Coupling, Pulleys, Belts, and Chain Drives	
Unit 3	Gears and Gear Ratio	
Unit 4	Advanced Couplings	
Unit 5	Basic Alignment (Lab)	

Volume 6	Bearing and Lubrication	Week 3
Unit 1	Principals of Bearing Operation	
Unit 2	Lubricants	
Volume 7	Basic Mechanical Components	
Unit 1	Levers, Cranks, Linkages, and Springs	
Unit 2	Types and Uses of Cams and Timing Adjustments	
Unit 3	Use of Elementary Timing Model In Timing Adjustments	

Volume 8	Machine Adjustment Fundamentals	Week 4
Unit 1	Troubleshooting, Problem Solving, and Problem Identification Techniques	
Unit 2	Set Up Machine Standards Using Advanced Timing Model	
Unit 3	Problem Solving On Multiple Systems using Advanced Timing Model	
Volume 8A	Basic Pneumatics and Hydraulics	
Unit 2A	Air Compression and Properties of Air	
Unit 2B	Basic Pneumatic, Devices, and Schematics	
Unit 3A	Hydraulic Flow and Control	

Volume 9	Electrical	Week 5
Unit 1	Principals of Electricity	
Unit 2	Circuit Components, Switches, and Relays	
Unit 3	Digital Multimeter and Basic Measurements	
Unit 4	Input and Output Devices	
Unit 5	Electrical Schematics	
Unit 6	Generators and Transformers	
Unit 7	DC Machines	



Volume 10	Pump Basics	Week 6
Unit 1	Pump Basics	
Volume 11	Valve Operation	
Unit 1	Valve Operation and Types	
Volume 11A	Basic Process Control	
Unit 1	Introduction To Process Control	
Unit 2	Basic Definitions	
Unit 3	Pressure	
Unit 4	Temperature	
Unit 5	Level	
Unit 6	Flow	
Unit 7	Analytical Instruments and Terminology	
Unit 8	Basic Transmitters	
Unit 9	Controllers	
Unit 10	Process Control and Control Loops	
Unit 11	Control Schemes	
Volume 13	Gear Box Maintenance	Week 7
Unit 1	Gear Maintenance	
Procedure 1	Introduction to Gear Components and Terminology	
Procedure 2	Introduction to Parallel Shaft Gearing	
Procedure 3	Installation of Spur Gears and Measurement of Backlash	
Procedure 4	Introduction to Installation of Tapered Roller Bearings	
Procedure 5	Installing Helical Gearing	
Procedure 6	Introduction to Cross Shaft Gearing	
Procedure 7	Introduction to 90 Degree Shaft Gearing	
Procedure 8	Installation and Adjustment of Bevel Gears	
Procedure 9	Installation and Adjustment of Worm/Worm Gear Sets	
Volume 14	Bearing Maintenance	Week 8
Unit 1	Bearing Maintenance	
Procedure 1	Introduction to Rolling Element Bearing Construction and Terminology	
Procedure 2	Introduction to Rolling Element Bearing Types	
Procedure 3	Introduction to Rolling Bearing Clearances	
Procedure 4	Bearing Maintenance Pre-Checks	
Procedure 5	Bearing Failure and Analysis	
Procedure 6	Cold Mounting and Removal of Radial Ball Bearings	
Procedure 7	Hot Mounting of Angular Contact Ball Bearing Using a Cone Heater	
Procedure 8	Remove Close-Fit Bearing Using a Bearing Separator and Puller	
Procedure 9	Mounting and Dismounting a Seperable Needle Bearing	
Procedure 10	Mounting of Spherical Roller Bearing on a Tapered Shaft	
Procedure 11	Mounting and Dismounting a Tapered Bore Spherical Roller Bearing on an Adapter Sleeve	
Procedure 12	Mounting and Dismounting a Tapered Bore Spherical Roller Bearing using a Withdrawal Sleeve	
Procedure 13	Installation of Externally Seated Radial Ball Bearings	
Volume 18	Pump Maintenance	Week 9
Unit 1	Pump Maintenance	
Procedure 1	Gear Pump	
Procedure 2	Axial Piston Pump	
Procedure 3	Rotary Piston Pump	
Volume 21	Advanced Fundamentals Package Machine Simulator	
Unit 1	Troubleshooting, Problem Solving and Problem Identification Techniques	
Unit 2	Set Up Machine Standards Using the Packaging Machine Simulator	
Unit 3	Problem Solving on Multiple Systems Using the Packaging Machine Simulator	
	Extra Days Required due to No class---Holidays	Week 10