



IPMBA

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IPMBA Maintenance Officer Certification Course Curriculum Overview

Thank you for your interest in the IPMBA Maintenance Officer Certification Course. This document contains the following to familiarize you to the IPMBA curriculum:

IPMBA Maintenance Officer Certification Course Fact Sheet: this is an overview of the various components which comprise the course.

IPMBA Maintenance Officer Certification Course Model Schedule: this is the model schedule for the 40-hour Maintenance Officer Certification Course.

IPMBA Unit Plans: this contains Unit Plans for each unit of instruction comprising the IPMBA Maintenance Officer Certification Course.

IPMBA Maintenance Officer Certification Course Required Materials & Equipment Checklist: this provides a list of material and equipment generally required of all students enrolling in the IPMBA Maintenance Officer Certification Course.

Please contact IPMBA at www.ipmba.org, info@ipmba.org or 410-744-2400 with questions, more information, or for assistance in locating an IPMBA Maintenance Officer Certification Course.



IPMBA Maintenance Officer Certification Course Fact Sheet

Course	Maintenance Officer Certification Course
Length	40 hours
Intended Audience	Public safety personnel or civilians who are responsible for maintaining public safety bicycles and fleet management. All candidates must possess basic bike maintenance skills and mechanical aptitude. Candidates are not required to be public safety cyclists if they are civilian employees of/contractors to the department and responsible for bike maintenance (e.g., fleet mechanics), nor are they required to have completed the IPMBA Police, EMS, or Security Cyclist Course.
Skills Practiced	<ul style="list-style-type: none"> • Tire and Tube Installation • Pedal and Pedal Retention Installation • Chain Installation, Removal, Cleaning and Lubrication • Derailleur Adjustment • Removal and Installation of Cassettes, Sprockets, and Freewheels • Crank Removal and Installation • Replacement of Bottom Bracket Bearings • Servicing Hubs • Brake Maintenance • Handlebar, Stem, Saddle, and Seatpost Adjustments • Headset Overhaul, Adjustment, and Installation • Wheel Truing
Equipment and Materials	<ul style="list-style-type: none"> • See <i>Required Tool and Equipment Checklist</i> • Student Handouts • Park Tool's <i>Big Blue Book of Bicycle Repairs</i>, 3rd Edition
Successful Completion	<p>IPMBA MOCC Certificate of Completion is available to those who:</p> <ul style="list-style-type: none"> • Score a minimum of 76% on the written test. • Pass the practical Diagnostic Test. • Miss no more than 10% of the class time. • Be a member of or join IPMBA. • Submit the certificate application and fee.



IPMBA Maintenance Officer Certification Course Model Schedule

Day One

0800	Introductions, Class Outline and Procedures
0830-1200	Basic Mechanics
	Tires and Tubes
	Pedals
1200-1300	Lunch
1300-1730	Chains
	Derailleurs
	Review

Day Two

0800-1200	Cranksets and Bottom Brackets
	Hubs
	Rear Sprockets
1200-1300	Lunch
1300-1730	Handlebars, Stems, Saddles, and Seatposts
	Headsets
	Review

Day Three

0800-1200	Disc Brakes
	Rim Brakes
1200-1300	Lunch
1300-1730	Frame and Fork
	Suspension
	On-Ride Repairs (Diagnosis and Repair)
	Review

Day Four

0800-1200	Wheel Truing
	Discussion of New Bike Builds
1200-1300	Lunch
1300-1730	Paperwork, Documenting Repairs
	Diagnosing Problems
	Review

Day Five

0800-0830	Review
0830-0900	Practical Exam Set Up
0900-1200	Practical Exam
1200-1300	Lunch
1300-1430	Written Exam
1430-1500	Final Exam Review and Graduation



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UNIT PLAN 1 CHAPTER 2 – TIRES AND TUBES

REVIEW, DISCUSS, PRACTICE

- Causes of flat tires and tire and tube failures
- Inspection of inner tubes
- Repair of butyl inner tube with vulcanizing patch
- Installation of wheels
- Tubeless tire installation
- Optional: tubular tire mounting

EQUIPMENT NEEDED

- Bike
- Axle wrench (if student does not have a quick release wheel)
- Tire levers
- Pump
- Patch kit

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 2 CHAPTER 6 – PEDALS

REVIEW, DISCUSS, PRACTICE

- Pedal remover
- Pedal retention systems

EQUIPMENT NEEDED

- Pedal wrench
- 8 mm hex wrench
- Torque wrench with bits
- Grease / anti-seize

METHOD OF EVALUATION

Informal evaluation based on class participation.



UNIT PLAN 3 CHAPTER 8 - CHAINS

REVIEW, DISCUSS, PRACTICE

- Measuring chain length
- Chain service of various brands
- Chain service in emergency cases
- Chain wear
- Chain cleaning and lubrication

EQUIPMENT NEEDED

- Chain tool
- Repair stand
- Chain lubricant
- Rags

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 4 CHAPTER 9 – DERAILLEURS

REVIEW, DISCUSS, PRACTICE

- Shift lever placement
- Housing sizing and cutting
- Shift wire installation
- Front derailleur adjustments of height, rotation, limit screws, and indexing
- Rear derailleur position, limit screw, and indexing adjustment

EQUIPMENT NEEDED

- Hex wrenches
- Cable cutter
- Screwdriver (typically #2 cross tip)

METHOD OF EVALUATION

Informal evaluation based on class participation.



UNIT PLAN 5 CHAPTER 7 – CRANKSETS AND BOTTOM BRACKETS

REVIEW, DISCUSS, PRACTICE

- Pedal removal
- Crank removal and installation
- Bottom bracket bearing replacement

EQUIPMENT NEEDED

- Crank remover
- Crank bolt wrench
- Torque wrench with bits
- Grease / anti-seize
- Threadlockers
- Bottom bracket tool
- Adjustable type bottom bracket tool (as needed)
- Wrench to turn bottom bracket tool

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 6 CHAPTER 4 – HUBS

REVIEW, DISCUSS, PRACTICE

- Service and adjustment of rear cup-and-cone hub
- Wear issues of bearing systems
- Review various types of cartridge bearing hubs
- Review the service on the rear freehub

EQUIPMENT NEEDED

- Wheel with adjustable hub
- Cone wrenches
- Wrench for cone locknuts
- Grease
- Rags
- Solvent
- Cleaning brushes
- Hub spacers for hub adjustment

METHOD OF EVALUATION

Informal evaluation based on class participation.



UNIT PLAN 7 CHAPTER 3 – REAR SPROCKETS

REVIEW, DISCUSS, PRACTICE

- Function of rear cogs
- Removal and installation of rear cassette, sprockets and freewheels
- Cleaning of cogs
- Fixed gear cogs
- Design aspects of cassettes: spacing, shifting ramps, hardness, interchangeability

EQUIPMENT NEEDED

- Bike Freewheel remover or cassette lockring tool to fit student bike
- Sprocket tool (chain whip)
- Adjustable wrench or other wrench to turn freewheel tool
- Rags

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 8 CHAPTER 13 – HANDLEBARS, STEMS, SADDLES, & SEATPOSTS

REVIEW, DISCUSS, PRACTICE

- Handlebar fit to stems
- Handlebar adjustments
- Stem fit to bike
- Stem adjustments
- Saddle fit to post
- Saddle adjustments

EQUIPMENT NEEDED

- Hex wrenches
- Straight edge
- Torque wrench and bits

METHOD OF EVALUATION

Informal evaluation based on class participation.



UNIT PLAN 9 CHAPTER 14 - HEADSETS

REVIEW, DISCUSS, PRACTICE

- Headset function
- Headset types
- Headset overhaul and adjustment
- Headset installation

EQUIPMENT NEEDED

- Hex wrench
- Headset wrenches (for threaded)
- Grease, rags, solvent (for overhaul)

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 10 CHAPTER 11 – CALIPER DISC BRAKE SYSTEMS

REVIEW, DISCUSS, PRACTICE

- Function of caliper systems
- Adjustment of caliper pads
- Brake line bleeding

EQUIPMENT NEEDED

- T-25 Torx for rotor bolts
- Hex wrenches
- Flashlights and white background
- Bleed kits

METHOD OF EVALUATION

Informal evaluation based on class participation.



UNIT PLAN 11

CHAPTER 12 – CALIPER RIM BRAKE SYSTEMS

REVIEW, DISCUSS, PRACTICE

- Cable system function and cable installation
- Lubrication of cables
- Adjusting pads to rim and centering calipers

EQUIPMENT NEEDED

- Hex wrenches
- Cable cutters
- File
- Rubber bands to assist in toe-in for threaded stud pads

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 12

CHAPTER 15 – FRAME AND FORK

REVIEW, DISCUSS, DEMONSTRATE

- Component parts of the frame
- Damage to frame or fork from crashing

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 13

CHAPTER 16 - SUSPENSION

REVIEW, DISCUSS, DEMONSTRATE

- Concept of linkage movement in suspension
- Concept of damping and energy loss
- Parts wear from movement of suspension systems

METHOD OF EVALUATION

Informal evaluation based on class participation.



UNIT PLAN 14 CHAPTER 17 – ON-RIDE REPAIR (DIAGNOSE)

REVIEW, DISCUSS, DEMONSTRATE

- Diagnose shifting issue
- Diagnose braking issue
- Recognize a damaged frame
- Diagnose issues with drive train

METHOD OF EVALUATION

Informal evaluation based on class participation.

UNIT PLAN 15 CHAPTER 5 – WHEEL TRUING

REVIEW, DISCUSS, PRACTICE

- Wheel theory
- All aspects of truing (lateral, radial, dish, and tension)
- Wheel and rim damage

EQUIPMENT

- Spoke wrench to fit
- Lubricant
- Rags
- Dishing tool (minimum one per two students)
- Truing stands

METHOD OF EVALUATION

Informal evaluation based on class participation.

2018 IPMBA MOCC Required Tool List/Order Form

Please select the tools you need to purchase, complete page two, and submit to Bike Cycles (see order form, page 2)

This toolkit is designed both for in-class use and to ensure you have a properly equipped department repair facility.

***Items marked with an asterisk (*) may be shared by two members from the same agency.**

****Items marked with two asterisks (**) may be shared but will result in reduced practice.**

Other Required Materials

	Tool Description	Unit Price	Quantity	Total	Item
*	PARK BBT-10.2 ADJUSTING CAP TOOL	\$ 13.77			one dozen shop rags
*	PARK BBT-19.2 BB TOOL SHIM/ISIS/RACEFACE/+	\$ 20.85			bike lube
	PARK CN-10 CABLE AND HOUSING CUTTER	\$ 34.15			tube of bike grease
*	PARK CNW-2 CHAINRING NUT WRENCH	\$ 3.75			toothbrush(es)
	PARK CT-3.2 SCREW TYPE CHAIN TOOL	\$ 34.15			eye protection
*	PARK FR-5.2 CASS LOCKRING TOOL w/GUIDEPIN	\$ 7.55			clothes that can get greasy
	PARK MW-SET.2 METRIC WRNCHSETx10 6-17mm	\$ 74.05			shop apron/coveralls (opt.)
	PARK PRS-25 TEAM ISSUE PORTABLE STAND	\$ 306.80			duty bike
*	PARK PW-4 PROFESSIONAL PEDAL WRENCH 15mm	\$ 33.20			helmet for test rides
*	PARK SBC-1 SPOKE, BEARING, COTTER GAUGE	\$ 9.45			riding clothes
*	PARK SBS-1 SOCKET AND BIT SET	\$ 23.50			
	PARK SCW-SET.3 CONE WRNCHSx13 13-24,28mm	\$ 73.10			
*	PARK SR-2.2 SHOP SPRCKTREMOVER/CHAINWHIP	\$ 36.05			
	PARK SW-7 3X SPOKE WRENCH .127 .130 .136	\$ 9.02			
*	PARK TM-1 SPOKE TENSION METER	\$ 80.70			
**	PARK TS-2.2 PROFESSIONAL TRUING STAND	\$ 237.45			
*	PARK TW-5 RATCHETING CLICK-TYPE TORQUE WRENCH (LOW)	\$ 105.40			
*	PARK TW-6 RATCHETING CLICK-TYPE TORQUE WRENCH (HIGH)	\$ 120.60			
*	PARK DAG-2.2 DERAILLEUR HANGER ALIGNMENT GAUGE	\$ 71.20			
*	PARK DC-1 DIGITAL CALIPER	\$ 56.95			
	PARK TL-1.2 TIRE LEVERS SET OF 3	\$ 3.32			
*	PARK PFP-8 HOME MECHANIC FLOOR PUMP	\$ 35.10			
	PARK SD-SET SCREWDRIVER SET OF 4	\$ 18.95			
	PARK SP-7 SIDECUTTER PLIERS	\$ 25.60			
*	PARK PAW-12 12" ADJUSTABLE WRENCH	\$ 32.25			
	PARK HXS-1.2 HEX WRENCH SET	\$ 23.70			
	PARK NP-6 NEEDLENOSE PLIERS	\$ 25.60			
	SUBTOTAL	\$1,516.21			
*	PARK BX-2 BLUE BOX TOOL CASE (OPTIONAL)	\$ 262.15			
	TOTAL	\$1,778.36			
*	BRAND-SPECIFIC DISC BRAKE BLEED KIT				Purchase from Your Local Shop