

BASIC METAL WORKER PROGRAM OF INSTRUCTION

PREFACE

1. The Basic MetalWorkers Course is designed to provide instruction for the tasks listed in Section VI of this POI. The terminal learning objectives for each lesson in Section IV have been developed from the task list. Both the task inventory and learning objectives are continually refined through the procedure set forth in Section VII.

2. All agencies and commands receiving graduates of this course, and specifically those sighted in Section VIII, are requested to review the contents of this POI and evaluate performance of the graduates against field requirements. Comments and recommendations may be submitted to:

COMMANDING OFFICER
Marine Corps Detachment
U.S. Army Ordnance Center and School
Aberdeen Proving Ground, Maryland 21005-5281
ATTN: Curriculum Development Officer

3. The following information for this course has been submitted for inclusion in the current edition of NAVMC 2771 (Formal School Catalog):

BASIC METAL WORKER PROGRAM OF INSTRUCTION

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BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION I - COURSE DESCRIPTIVE DATA

1. COURSE TITLE. BASIC METAL WORKER
2. LOCATION. Marine Corps Detachment,
U.S. Army Ordnance Center & School
Aberdeen Proving Ground, Maryland 21005-5281
3. COURSE ID. A011321
4. OTHER SERVICE COURSE NUMBER. NONE
5. MILITARY ARTICLES AND SERVICE LIST NUMBER. NONE
6. PURPOSE. To provide all entry level Marines in the Military Occupational Specialty 1316 - Welders with the basic techniques and knowledge needed to effectively perform required tasks as set out by MCO 1510.95A.
7. SCOPE. This course is designed to train entry level students the basic welding fundamentals in Setup Procedures, Oxy/Acetylene Welding and Cutting, Shielded Metal Arc Welding (SMAW), Gas tungsten Arc Welding (GTAW), and Gas Metal Arc Welding (GMAW). The student will also perform LAV Armor Plate repair and have preliminary training and classes on Titanium, Safety inspections, radiator repair, SL-3 inventory, Hobart Welder/Trailer, metal shear operations, and NAVMC Records and Forms.
8. LENGTH (PEACETIME). 64 Training Days
9. CURRICULUM BREAKDOWN (PEACETIME).

558.00 Academic Hours
 1.00 Computer-Based Training
 7.00 COMPUTERIZED EXAM
 35.35 Demonstration
 63.00 Lecture
 416.65 Practical Application
 31.00 Performance Exam
 4.00 Written Exam

0.00 Administrative Hours
10. LENGTH (MOBILIZATION). 64 Training Days
11. CURRICULUM BREAKDOWN (MOBILIZATION). Same as Peacetime.
12. MAXIMUM CLASS CAPACITY. 8
13. OPTIMUM CLASS CAPACITY. 6
14. MINIMUM CLASS CAPACITY. 4
15. CLASS FREQUENCY. 13
16. STUDENT PREREQUISITES. Cpl and below, normal color vision, MM score of 95 or higher.
17. MOS RECEIVED. 1316
18. QUOTA CONTROL. HQMC, MMEA
19. FUNDING. HQMC, MMEA

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SECTION I - COURSE DESCRIPTIVE DATA

20. REPORTING INSTRUCTIONS. Students report to the Commanding Officer, Marine Corps Detachment, U.S. Army Ordnance Center & School, Aberdeen Proving Ground, Maryland 21005-5281
Government Messing and Billeting are available.

21. INSTRUCTOR STAFFING REQUIREMENTS. See Appendix A for Instructor Computation Worksheet.

<u>LN#</u>	<u>GRADE</u>	<u>MOS</u>	<u>BILLET DESCRIPTION</u>	<u>REQUIRED</u>
198B	E5	1316	Instructor, Metals	2
198C	E6	1316	Instructor, Metals	5

22. SCHOOL OVERHEAD REQUIREMENTS.

23. TRAINING/EDUCATION SUPPORT REQUIREMENTS. None in excess of T/E.

24. TASK LIST. See Appendix B.

CDD NOTES: NONE

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SECTION I - COURSE DESCRIPTIVE DATA

APPENDIX B - TASKLIST

DUTY: 1316.01 PERFORM EQUIPMENT OPERATIONAL PROCEDURES

- TASKS: (S) 1316.01.01 PERFORM OPERATIONS CHECKS ON WELDING/CUTTING EQUIPMENT
- (P) 1316.01.02 CUT SHEET METAL WITH METAL SHEER
- (S) 1316.01.03 CUT METAL WITH PLASMA ARC EQUIPMENT
- (S) 1316.01.07 CONDUCT SAFETY INSPECTIONS

DUTY: 1316.02 PERFORM OXYGEN/ACETYLENE WELDING OPERATIONS

- TASKS: (S) 1316.02.02 WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT
- (P) 1316.02.05 CUT CARBON STEEL WITH OXYACETYLENE EQUIPMENT
- (P) 1316.02.06 Weld sheet metal with Oxyacetylene equipment

DUTY: 1316.03 PERFORM SHIELDED METAL ARC WELDING OPERATIONS

- TASKS: (S) 1316.03.01 WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT
- (S) 1316.03.03 WELD ALLOY STEELS WITH SHIELDED METAL ARC WELDING EQUIPMENT
- (P) 1316.03.06 WELD CAST STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT
- (S) 1316.03.07 WELD ARMOR PLATE WITH SHIELDED METAL ARC WELDING EQUIPMENT

DUTY: 1316.04 PERFORM GAS METAL ARC WELDING OPERATIONS

- TASKS: (S) 1316.04.01 WELD CARBON STEEL WITH GAS METAL ARC WELDING EQUIPMENT
- (P) 1316.04.02 WELD ALLOY STEEL WITH GAS METAL ARC WELDING EQUIPMENT
- (S) 1316.04.03 WELD ALUMINUM WITH GAS METAL ARC WELDING EQUIPMENT
- (P) 1316.04.04 Weld stainless steel with Gas Metal Arc Welding equipment
- (P) 1316.04.06 WELD ARMOR PLATE WITH GAS METAL ARC WELDING EQUIPMENT

DUTY: 1316.05 PERFORM GAS TUNGSTEN ARC WELDING OPERATIONS

- TASKS: (P) 1316.05.03 WELD ALLOY STEEL WITH GAS TUNGSTEN ARC WELDING EQUIPMENT
- (S) 1316.05.04 WELD ALUMINUM WITH GAS TUNGSTEN ARC WELDING EQUIPMENT
- (S) 1316.05.05 WELD STAINLESS STEEL WITH GAS TUNGSTEN ARC WELDING EQUIPMENT
- (P) 1316.05.07 Weld Titanium with Gas Tungsten Arc Welding equipment.

DUTY: 1316.06 PERFORM WELDING SHOP OPERATIONS

- TASKS: (P) 1316.06.01 FABRICATE SPECIAL TOOLS AND METAL OBJECTS
- (S) 1316.06.02 PERFORM FOREHAND/BACKHAND WELDING
- (S) 1316.06.03 PERFORM IDENTIFICATION TESTS ON METAL
- (S) 1316.06.04 PERFORM INTERMITTENT BACK STEP WELDING

DUTY: 1316.07 REPAIR RADIATORS / FUEL TANKS

- TASKS: (P) 1316.07.01 Repair Radiators/Fuel Tanks

DUTY: 1316.08 WELDING EQUIPMENT RECORDS

- TASKS: (P) 1316.08.02 Complete Equipment Repair Order and Equipment Repair Order Shopping Transaction Llist

DUTY: 1316.09 COMPLETE WELDING SHOP OPERATIONS

- TASKS: (P) None.

DUTY: 1316.10 GENERAL

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SECTION I - COURSE DESCRIPTIVE DATA

APPENDIX B - TASKLIST

TASKS: (S) 1316.10.02 Conduct inventory of tools sets, chests, and kits.

TASK LIST NOTES: NONE

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SECTION II - SUMMARY OF HOURS

PEACETIME (64 TRAINING DAYS)

ACADEMIC TIME

<u>TITLE</u>	<u>HOURS</u>	<u>ANNEX</u>
SHOP FUNDAMENTALS	51.20	A
OXYACETYLENE WELDING AND CUTTING OPERATIONS	90.00	B
SHIELDED METAL ARC WELDING (SMAW)	80.00	C
GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)	115.80	D
ARMOR PLATE WELDING	114.00	E
MARINE UNIQUE	<u>107.00</u>	L
TOTAL ACADEMIC HOURS:	558.00	

ADMINISTRATIVE TIME

TOTAL ADMINISTRATIVE HOURS: 0.00

SUMMARY (PEACETIME)

ACADEMIC TIME	558.00
ADMINISTRATIVE TIME	<u>0.00</u>
TOTAL ACADEMIC AND ADMINISTRATIVE TIME:	558.00

MOBILIZATION (64 TRAINING DAYS)

NONE

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SECTION III - SCOPE OF ANNEXES

A. SHOP FUNDAMENTALS. The student will receive TRADOC directed training, will demonstrate skills in shop fundamentals, shop drawings, hand and measuring tools, metal identification, welding joints and symbols, OSHA, OPSEC, and drilling operations.

B. OXYACETYLENE WELDING AND CUTTING OPERATIONS. The student will perform PMCS, Set up and operate oxyacetylene welding and cutting equipment, weld mild steel joints in the flat, vertical, horizontal and overhead positions, brazing, soldering and cutting.

C. SHIELDED METAL ARC WELDING (SMAW). STUDENTS ARE TAUGHT THE BASIC FUNDAMENTALS OF ELECTRICITY, ALSO THE BASIC FUNDAMENTALS FOR WELDING ON 1/4" AND 1/2" MILD STEEL IN THE FLAT, HORIZONTAL, VERTICAL, AND OVERHEAD POSITION.

D. GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW). The student will perform PMCS, setup and operate Gas Metal Arc Welding and Gas Tungsten Arc welding equipment. Welding procedures taught on Aluminum, Stainless, and Mild Steel plates.

E. ARMOR PLATE WELDING. Students will perform Plasma Cutting, Air Arc Cutting/Gouging, LAV Armor Plate Welding.

L. MARINE UNIQUE. STUDENT WILL GAIN KNOWLEDGE AND DEMONSTRATE MASTERY IN MARINE CORPS PUBLICATIONS, NAVMC RECORDS AND FORMS, SL-3 INVENTORY, HOBART WELDER/TRAILER, GTAW TITANIUM, METAL SHEAR OPERATIONS, RADIATOR/FUEL TANK REPAIR, SAFETY, AND FABRICATION OF SPECIAL TOOLS AND EQUIPMENT.

BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

1. A concept card is developed to describe each academic or administrative block of time during a course. These concept cards are then grouped into subject areas, called annexes, which are summarized in Section III. Annexes A through Y are reserved for academic lessons and exams. Annex Z is reserved for administrative time.

2. The following information is contained on each academic concept card in Section IV:

a. Heading. The heading listed at the top of the concept card includes the name of the course, the section of the POI, and the letter and title of the annex to which the lesson or exam is assigned.

b. Lesson/Exam ID. This designator is a unique code assigned to this specific lesson or exam within this course.

c. Hours. This number (carried to the second decimal place) depicts the amount of time required to conduct the lesson or exam once, even if it is presented multiple times to smaller groups of students.

d. Title. This is the title assigned to this lesson or exam. It should refer to the subject matter covered in the lesson or exam when possible.

e. Phase (optional). This is a code depicting the phase (e.g., week, month, etc.) of the course during which this lesson or exam takes place.

f. Group (optional). This is a code depicting the instructional group or section responsible for teaching or developing this lesson or exam.

g. Methods,Hours,S:I Ratio. Displayed on the concept card are codes which symbolize the methods of instruction used to present this lesson or exam. Following each method code is the time (in hours) allocated to that method and the student to instructor ratio associated with that period of time. (The hours and ratios depicted on the concept card are used to determine instructor staffing requirements.) The following is a comprehensive list of methods used in this course and their respective codes:

<u>Method</u>	<u>Code</u>
Computer-Based Training	CBT
COMPUTERIZED EXAM	CE
Demonstration	D
Lecture	L
Practical Application	PA
Performance Exam	X(P)
Written Exam	X(W)

h. Media. Displayed on the concept card are codes which symbolize the media used to support this lesson or exam. The following is a comprehensive list of media used in this course and their respective codes:

<u>Medium</u>	<u>Code</u>
Actual Item/Object	AIO
Blackboard	B
Computer	CPU
Handout	HO
Model	M
Slides	S
Supplement to lesson outline for student	SUPPL
TELEVISION	TV
VIDEO CASSETTE RECORDER	VCR
Videotape	VT
Workbook	WBK

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SECTION IV - CONCEPT CARDS

i. Learning Objective(s)/Lesson Purpose. Academic concept cards contain either learning objectives or a lesson purpose statement, but not both.

(1) Learning Objective. A learning objective describes a behavior that students are expected to perform following instruction, not necessarily identical to a behavior performed on the job. It also details the conditions under which that behavior is performed and the minimum standards of acceptable performance. A student masters the objective when his or her performance equals or exceeds the standard. (Information concerning student evaluation and mastery is contained in Section V of this POI.)

(a) Terminal Learning Objective (TLO). One, and only one, TLO is written for each task in Section I-B of the POI. The behavior in the TLO duplicates the actual behavior required on the job, modified only if the constraints of the academic environment will not allow it. A TLO should only appear on a concept card for a lesson or exam during which students actually perform the TLO. Each TLO is assigned a numeric designator identical to the designator of its corresponding task in Section I-B, which is identical to the designator of the Individual Training Standard (ITS) from which the task was derived. This designator is located in parentheses at the end of the TLO.

(b) Enabling Learning Objective (ELO). ELOs are designed to teach students the knowledges and skills required for successful performance of the TLOs. Each ELO is placed only on concept cards for lessons or exams during which students actually perform the ELO. Many introductory lessons will contain only ELOs. Each ELO is assigned the same numeric designator as the TLO it supports, followed by a unique combination of one or two letters. This designator is located in parentheses at the end of the ELO. (The first 26 ELOs are assigned the letters "a" through "z" consecutively. If there are more than 26 ELOs, they are assigned the letters "aa" through "az," then "ba" through "bz," etc.)

(2) Lesson Purpose. A lesson purpose statement is recorded on a concept card where no learning objectives are appropriate (e.g., overview, orientation, or enrichment lesson) and the lesson is not to be evaluated. The lesson purpose statement clearly describes the rationale for presenting the lesson.

j. Ammunition Requirements. Whenever a lesson requires the use of ammunition by students or by the instructional staff in support of the lesson, the concept card for that lesson will include a table depicting those requirements. Included for each type of ammunition will be its Department of Defense Identification Code (DODIC), its nomenclature, the average number of rounds used by each student, and the number of support rounds.

k. Notes (optional). This section of the concept card contains any information pertinent to the lesson. Examples of items which may be addressed here are instructor requirements, scheduling notes, special prerequisites, references to tests on which material will be evaluated, etc.

l. References. This section contains the source documents used for development of the lesson or other references which relate to the lesson. At a minimum, it must contain all documents referenced in the learning objectives included on the concept card.

3. The following information is contained on each administrative concept card in Section IV:

a. Heading. The heading listed at the top of the concept card includes the name of the course, the section of the POI, and the fact that this concept card is part of Annex Z, Administrative Time.

b. Event ID. This designator is a unique code assigned to this administrative event within the course.

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SECTION IV - CONCEPT CARDS

c. Hours. This number (carried to the second decimal place) depicts the amount of administrative time required for this event. If this is a repeating event, one concept card may indicate the cumulative hours associated with this event throughout the course.

d. Event. This is a short description of the administrative event.

e. Notes (optional). This section of the concept card contains any information pertinent to the administrative block of time.

4. The following pages contain useful information for locating the learning objectives and lessons that make up this course.

a. Location of Learning Objectives Report. This report lists, by learning objective designator, all learning objectives developed for this course. It also identifies every concept card on which each learning objective is included.

b. Academic and Administrative Summaries. These reports list, by annex, all academic and administrative concept cards in Section IV. Within each annex the concept cards are listed in lesson identifier order. The information provided for each entry includes Identifier, Title, Hours, and Type [Task-oriented lesson (T), Lesson Purpose lesson (LP), Exam (E), or Administrative Time (ADM)]. A subtotal of hours is provided for each annex and for all academic and administrative concept cards. Total POI hours are listed at the end of the Administrative Summary.

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SECTION IV - CONCEPT CARDS

LOCATION OF LEARNING OBJECTIVES REPORT

LO	ANNEX	LESSON ID	LESSON TITLE
1316.01.01	L	SNXLBJ	HOBART WELDER/TRAILER
	L	SNXLBK	HOBART WELDER / TRAILER JOB KNOWLEDGE/PERFORMANCE EXAM
1316.01.01a	L	SNXLBJ	HOBART WELDER/TRAILER
1316.01.01b	L	SNXLBJ	HOBART WELDER/TRAILER
1316.01.01c	L	SNXLBJ	HOBART WELDER/TRAILER
1316.01.01d	L	SNXLBJ	HOBART WELDER/TRAILER
1316.01.01e	L	SNXLBJ	HOBART WELDER/TRAILER
1316.01.02	L	SNXLBD	METAL SHEAR OPERATIONS
1316.01.02a	L	SNXLBD	METAL SHEAR OPERATIONS
1316.01.02b	L	SNXLBD	METAL SHEAR OPERATIONS
1316.01.02c	L	SNXLBD	METAL SHEAR OPERATIONS
1316.01.03	E	SWXEBA	SMAW ARMOR PLATE
1316.01.07	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
	L	SNXLBG	SAFTEY INSPECTIONS JOB KNOWLEDGE TEST
1316.01.07a	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07b	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07c	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07d	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07e	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07f	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07g	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07h	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07i	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07j	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.01.07k	L	SNXLBF	CONDUCT SAFTEY INSPECTIONS
1316.02.02	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAA	SET UP OXYACETYLENE WELDING AND CUTTING EQUIP. ADJUST 3 BASIC FLAMES
	B	SWXBAB	STRING BEADS WITH AND WITHOUT ROD
	B	SWXBAC	FLAT POSITION MILD STEEL WELDING
	B	SWXBAD	HORIZONTAL POSITION MILD STEEL WELDING
	B	SWXBAE	VERTICAL POSITION MILD STEEL WELDING

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SECTION IV - CONCEPT CARDS

LOCATION OF LEARNING OBJECTIVES REPORT

LO	ANNEX	LESSON ID	LESSON TITLE
	B	SWXBAF	OVERHEAD POSITION MILD STEEL WELDING
	B	SWXBAH	BRAZING OPERATIONS
	B	SWXBAK	JOB KNOWLEDGE / PERFORMANCE TEST
1316.02.02a	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAA	SET UP OXYACETYLENE WELDING AND CUTTING EQUIP. ADJUST 3 BASIC FLAMES
1316.02.02b	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAB	STRING BEADS WITH AND WITHOUT ROD
1316.02.02c	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAC	FLAT POSITION MILD STEEL WELDING
1316.02.02d	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAD	HORIZONTAL POSITION MILD STEEL WELDING
1316.02.02e	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAE	VERTICAL POSITION MILD STEEL WELDING
1316.02.02f	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAF	OVERHEAD POSITION MILD STEEL WELDING
1316.02.02g	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAH	BRAZING OPERATIONS
1316.02.05	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAJ	OXYACETYLENE CUTTING
1316.02.05a	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAJ	OXYACETYLENE CUTTING
1316.02.05b	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAJ	OXYACETYLENE CUTTING
1316.02.06	A	SWXAAN	JOB KNOWLEDGE TEST
	B	SWXBAG	WELD THIN SHEET METAL
1316.03.01	C	SWXCAA	IDENTIFICATION AND USE OF ELECTRODES
	C	SWXCAB	SET UP OF SHIELDED METAL ARC WELDING (SMAW) EQUIPMENT
	C	SWXCAC	STRING, WEAVE BEADS AND SURFACE BUILDUP
	C	SWXCAD	FLAT POSITION SMAW WELDING
	C	SWXCAE	HORIZONTAL POSITION SMAW WELDING
	C	SWXCAF	VERTICAL POSITION SMAW WELDING
	C	SWXCAG	OVERHEAD POSITION SMAW WELDING
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST
1316.03.01a	C	SWXCAA	IDENTIFICATION AND USE OF ELECTRODES
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST
1316.03.01b	C	SWXCAB	SET UP OF SHIELDED METAL ARC WELDING (SMAW) EQUIPMENT
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST
1316.03.01c	C	SWXCAC	STRING, WEAVE BEADS AND SURFACE BUILDUP
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST

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SECTION IV - CONCEPT CARDS

LOCATION OF LEARNING OBJECTIVES REPORT

LO	ANNEX	LESSON ID	LESSON TITLE
1316.03.01d	C	SWXCAD	FLAT POSITION SMAW WELDING
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST
1316.03.01e	C	SWXCAE	HORIZONTAL POSITION SMAW WELDING
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST
1316.03.01f	C	SWXCAF	VERTICAL POSITION SMAW WELDING
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST
1316.03.01g	C	SWXCAG	OVERHEAD POSITION SMAW WELDING
	C	SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST
1316.03.03	E	SWXEBA	SMAW ARMOR PLATE
1316.03.03a	E	SWXEBA	SMAW ARMOR PLATE
1316.03.03b	E	SWXEBA	SMAW ARMOR PLATE
1316.03.06	C	SWXCAA	IDENTIFICATION AND USE OF ELECTRODES
1316.03.06a	C	SWXCAA	IDENTIFICATION AND USE OF ELECTRODES
1316.03.06b	C	SWXCAA	IDENTIFICATION AND USE OF ELECTRODES
1316.03.07	E	SWXEBA	SMAW ARMOR PLATE
	E	SWXEBH	SMAW ARMOR PLATE JOB KNOWLEDGE / PERFORMANCE EXAM
1316.03.07a	E	SWXEBA	SMAW ARMOR PLATE
	E	SWXEBH	SMAW ARMOR PLATE JOB KNOWLEDGE / PERFORMANCE EXAM
1316.03.07b	E	SWXEBA	SMAW ARMOR PLATE
	E	SWXEBH	SMAW ARMOR PLATE JOB KNOWLEDGE / PERFORMANCE EXAM
1316.03.07c	E	SWXEBA	SMAW ARMOR PLATE
	E	SWXEBH	SMAW ARMOR PLATE JOB KNOWLEDGE / PERFORMANCE EXAM
1316.04.01	D	SWXDBF	SOLID CORE WELDING MILD STEEL
	D	SWXDBG	FLUX CORE WELDING MILD STEEL
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.01a	D	SWXDBF	SOLID CORE WELDING MILD STEEL
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.01b	D	SWXDBG	FLUX CORE WELDING MILD STEEL
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.02	E	SWXEBA	SMAW ARMOR PLATE
1316.04.03	D	SWXDBA	SET UP AND OPERATION OF GAS METAL ARC WELDING (GMAW) EQUIPMENT
	D	SWXDBB	GMAW FLAT POSITON
	D	SWXDBC	GMAW HORIZONTAL POSITON
	D	SWXDBD	GMAW VERTICAL POSITION
	D	SWXD BE	GMAW OVERHEAD POSITION
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST

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SECTION IV - CONCEPT CARDS

LOCATION OF LEARNING OBJECTIVES REPORT

LO	ANNEX	LESSON_ID	LESSON_TITLE
1316.04.03a	D	SWXDBA	SET UP AND OPERATION OF GAS METAL ARC WELDING (GMAW) EQUIPMENT
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.03b	D	SWXDBB	GMAW FLAT POSITON
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.03c	D	SWXDBD	GMAW VERTICAL POSITION
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.03d	D	SWXDBC	GMAW HORIZONTAL POSITON
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.03e	D	SWXDBE	GMAW OVERHEAD POSITION
	D	SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST
1316.04.04	D	SWXDBK	GTAW STAINLESS STEEL
1316.04.04a	D	SWXDBK	GTAW STAINLESS STEEL
1316.04.04b	D	SWXDBK	GTAW STAINLESS STEEL
1316.04.06	E	SWXEBA	SMAW ARMOR PLATE
1316.05.03	D	SWXDBI	SET UP AND OPERATION OF GAS TUNGSTEN ARC WELDING (GTAW) EQUIPMENT
1316.05.03a	D	SWXDBI	SET UP AND OPERATION OF GAS TUNGSTEN ARC WELDING (GTAW) EQUIPMENT
1316.05.03b	D	SWXDBI	SET UP AND OPERATION OF GAS TUNGSTEN ARC WELDING (GTAW) EQUIPMENT
1316.05.04	D	SWXDBI	SET UP AND OPERATION OF GAS TUNGSTEN ARC WELDING (GTAW) EQUIPMENT
	D	SWXD BJ	GTAW ALUMINUM
1316.05.04a	D	SWXD BI	SET UP AND OPERATION OF GAS TUNGSTEN ARC WELDING (GTAW) EQUIPMENT
1316.05.04b	D	SWXD BJ	GTAW ALUMINUM
1316.05.04c	D	SWXD BJ	GTAW ALUMINUM
1316.05.04d	D	SWXD BJ	GTAW ALUMINUM
1316.05.05	D	SWXD BK	GTAW STAINLESS STEEL
	D	SWXD BL	JOB KNOWLEDGE / PERFORMANCE TEST
1316.05.05a	D	SWXD BL	JOB KNOWLEDGE / PERFORMANCE TEST
1316.05.07	L	SNXLBC	GTAW TITANIUM
1316.05.07a	L	SNXLBC	GTAW TITANIUM

BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

LOCATION OF LEARNING OBJECTIVES REPORT

LO	ANNEX	LESSON ID	LESSON TITLE
1316.05.07b	L	SNXLBC	GTAW TITANIUM
1316.06.01	L	SNXLBL	FABRICATE SPECIAL TOOLS AND EQUIPMENT
1316.06.02	C	SWXCAD	FLAT POSITION SMAW WELDING
1316.06.02a	C	SWXCAD	FLAT POSITION SMAW WELDING
1316.06.02b	C	SWXCAD	FLAT POSITION SMAW WELDING
1316.06.03	A	SWXAAB	IDENTIFICATION OF METALS
1316.06.03a	A	SWXAAB	IDENTIFICATION OF METALS
1316.06.03b	A	SWXAAB	IDENTIFICATION OF METALS
1316.06.03c	A	SWXAAB	IDENTIFICATION OF METALS
1316.06.04	E	SWXEBA	SMAW ARMOR PLATE
1316.07.01	L B	SNXLBE SWXBAI	RADIATOR AND FUEL TANK REPAIR SOLDERING OPERATIONS
1316.07.01a	L	SNXLBE	RADIATOR AND FUEL TANK REPAIR
1316.07.01b	L	SNXLBE	RADIATOR AND FUEL TANK REPAIR
1316.08.02	L L	SNXLBA SNXLBB	NAVMC RECORDS AND FORMS NAVMC RECORDS AND FORMS EXAM
1316.08.02a	L	SNXLBA	NAVMC RECORDS AND FORMS
1316.08.02b	L	SNXLBA	NAVMC RECORDS AND FORMS
1316.08.02c	L	SNXLBA	NAVMC RECORDS AND FORMS
1316.08.02d	L	SNXLBA	NAVMC RECORDS AND FORMS
1316.10.02	L L	SNXLBH SNXLBI	SL-3 INVENTORY SL-3 INVENTORY JOB KNOWLEDGE EXAM
1316.10.02a	L	SNXLBH	SL-3 INVENTORY
1316.10.02b	L	SNXLBH	SL-3 INVENTORY
1316.10.02c	L	SNXLBH	SL-3 INVENTORY
1316.10.02d	L	SNXLBH	SL-3 INVENTORY

BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

ACADEMIC SUMMARY

IDENTIFIER	TITLE	HRS	TYPE
ANNEX A - SHOP FUNDAMENTALS			
SWXAAA	SHOP FUNDAMENTALS AND POLICIES	3.00	LP
SWXAAB	IDENTIFICATION OF METALS	3.00	T
SWXAAC	FIVE BASIC JOINTS AND WELDING SYMBOLS	3.00	LP
SWXAAD	HAND TOOLS AND MEASURING TOOLS	4.00	LP
SWXAAE	MAKE SHOP DRAWINGS	7.00	LP
SWXAAF	LAY OUT A WORKPIECE	2.00	LP
SWXAAG	SHARPEN A TWIST DRILL	1.00	LP
SWXAAH	OPERATE A DRILL PRESS	3.00	LP
SWXAAJ	OSHA HAZARD COMMUNICATION STANDARD	2.00	LP
SWXAAN	JOB KNOWLEDGE TEST	21.20	E
SWXHAA	RESPIRATOR PROTECTION	2.00	LP
Annex Total :		51.20	
ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS			
SWXBAA	SET UP OXYACETYLENE WELDING AND CUTTING EQUIP. ADJUST 3 BASIC FLAMES	4.00	T
SWXBAB	STRING BEADS WITH AND WITHOUT ROD	3.00	T
SWXBAC	FLAT POSITION MILD STEEL WELDING	10.00	T
SWXBAD	HORIZONTAL POSITION MILD STEEL WELDING	10.00	T
SWXBAE	VERTICAL POSITION MILD STEEL WELDING	10.00	T
SWXBAF	OVERHEAD POSITION MILD STEEL WELDING	13.00	T
SWXBAG	WELD THIN SHEET METAL	10.00	T
SWXBAH	BRAZING OPERATIONS	4.00	T
SWXBAI	SOLDERING OPERATIONS	4.00	T
SWXBAJ	OXYACETYLENE CUTTING	14.00	T
SWXBAK	JOB KNOWLEDGE / PERFORMANCE TEST	8.00	E
Annex Total :		90.00	
ANNEX C - SHIELDED METAL ARC WELDING (SMAW)			
SWXCAA	IDENTIFICATION AND USE OF ELECTRODES	1.00	T
SWXCAB	SET UP OF SHIELDED METAL ARC WELDING (SMAW) EQUIPMENT	1.00	T
SWXCAC	STRING, WEAVE BEADS AND SURFACE BUILDUP	10.00	T
SWXCAD	FLAT POSITION SMAW WELDING	10.00	T
SWXCAE	HORIZONTAL POSITION SMAW WELDING	17.00	T
SWXCAF	VERTICAL POSITION SMAW WELDING	17.00	T
SWXCAG	OVERHEAD POSITION SMAW WELDING	17.00	T
SWXCAJ	JOB KNOWLEDGE / PERFORMANCE TEST	7.00	E
Annex Total :		80.00	
ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)			
SWXDBA	SET UP AND OPERATION OF GAS METAL ARC WELDING (GMAW) EQUIPMENT	7.00	T
SWXDBB	GMAW FLAT POSITON	8.00	T
SWXDBC	GMAW HORIZONTAL POSITON	8.00	T
SWXDBD	GMAW VERTICAL POSITION	11.00	T
SWXDBE	GMAW OVERHEAD POSITION	11.00	T

BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

ACADEMIC SUMMARY

IDENTIFIER	TITLE	HRS	TYPE
SWXDBF	SOLID CORE WELDING MILD STEEL	10.00	T
SWXDBG	FLUX CORE WELDING MILD STEEL	10.00	T
SWXDBH	JOB KNOWLEDGE / PERFORMANCE TEST	8.00	E
SWXDBI	SET UP AND OPERATION OF GAS TUNGSTEN ARC WELDING (GTAW) EQUIPMENT	2.00	T
SWXDBJ	GTAW ALUMINUM	21.00	T
SWXDBK	GTAW STAINLESS STEEL	13.00	T
SWXDBL	JOB KNOWLEDGE / PERFORMANCE TEST	6.80	E
		Annex Total :	115.80
ANNEX E - ARMOR PLATE WELDING			
SWXEBA	SMAW ARMOR PLATE	77.00	T
SWXEBC	SMAW ARMOR PLATE JOB KNOWLEDGE / PERFORMANCE EXAM	37.00	E
		Annex Total :	114.00
ANNEX L - MARINE UNIQUE			
SNXLBA	NAVMC RECORDS AND FORMS	10.00	T
SNXLBB	NAVMC RECORDS AND FORMS EXAM	1.00	E
SNXLBC	GTAW TITANIUM	4.00	T
SNXLBD	METAL SHEAR OPERATIONS	8.00	T
SNXLBE	RADIATOR AND FUEL TANK REPAIR	4.00	T
SNXLBF	CONDUCT SAFTEY INSPECTIONS	8.00	T
SNXLBG	SAFTEY INSPECTIONS JOB KNOWLEDGE TEST	1.00	E
SNXLBH	SL-3 INVENTORY	7.00	T
SNXLBI	SL-3 INVENTORY JOB KNOWLEDGE EXAM	1.00	E
SNXLBJ	HOBART WELDER/TRAILER	12.00	T
SNXLBK	HOBART WELDER / TRAILER JOB KNOWLEDGE/PERFORMANCE EXAM	13.00	E
SNXLBL	FABRICATE SPECIAL TOOLS AND EQUIPMENT	38.00	T
		Annex Total :	107.00
ANNEX A - SHOP FUNDAMENTALS			
		Total Academic Hours :	558.00

BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

ADMINISTRATIVE SUMMARY

<u>IDENTIFIER</u>	<u>TITLE</u>	<u>HRS</u>	<u>TYPE</u>
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Total Administrative Hours : 0.00

Total POI Hours : 558.00

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAA

HOURS: 3.00

TITLE: SHOP FUNDAMENTALS AND POLICIES

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	3.00	8:1

MEDIA: B, HO, VT

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. Discussions on current departmental operating directives, shop, fire and safety practices, introduction to job related field manuals and technical manuals, self development tests as they apply to the metalworker, information concerning OSHA, ISS, and OPSEC to include various aspects of intelligence and student honor codes.

REFERENCE

REFERENCE #

- | | |
|--------------------------------|--------------|
| 1. INDEX OF IOM's | IOM 310-1 |
| 2. STUDENT COUNSELING CRITERIA | IOM 350-1 |
| 3. FIRE AND SAFETY | IOM 350-10-1 |
| 4. TRAINING ETIQUETTE | IOM 350-16 |
| 5. RECYCLE/RELIEF FOR STUDENTS | IOM 350-20 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAB

HOURS: 3.00

TITLE: IDENTIFICATION OF METALS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	1.00	8:1
PA	2.00	8:1

MEDIA: AIO, B, HO, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided necessary tools, metal to be tested and the reference, PERFORM IDENTIFICATION TESTS ON METAL To determine the material type per the reference. (1316.06.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, material and equipment perform magnetic test on various metals for proper identification in accordance with the references (1316.06.03a)
2. With the aid of references and given the necessary tools, material and equipment perform spark tests on various metals for proper identification in accordance with the references (1316.06.03b)
3. With the aid of references and given the necessary tools, material and equipment perform visual and weight tests on various metals for proper identification in accordance with the references (1316.06.03c)

REFERENCE

REFERENCE #

1. MODERN WELDING-1997

ALTHOUSE, TURNQUIST,

2. WELDING THEORY AND APPLICATION

TC 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAC

HOURS: 3.00

TITLE: FIVE BASIC JOINTS AND WELDING SYMBOLS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	3.00	8:1

MEDIA: HO

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. The student will identify the design, purpose and uses of the five basic welding joints. In addition, the student will identify the different types of welding symbols and their applications.

REFERENCE

1. MODERN WELDING-1997
2. WELDING THEORY AND APPLICATION

REFERENCE #

- ALTHOUSE, TURNQUIST,
TC 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAD

HOURS: 4.00

TITLE: HAND TOOLS AND MEASURING TOOLS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	3.00	8:1
PA	1.00	8:1

MEDIA: SUPPL

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. The students will be issued and inventory a welders toolbox and identify tools and necessary maintenance of tools. In addition, the student will receive training on how to use measuring tools to measure diameters, lengths, and widths of the stock samples. Measurements will be within 1/16 of actual dimensions.

REFERENCE

1. MODERN WELDING-1997
2. WELDING THEORY AND APPLICATION

REFERENCE #

ALTHOUSE, TURNQUIST,
TM 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAE

HOURS: 7.00

TITLE: MAKE SHOP DRAWINGS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	2.00	8:1
PA	5.00	8:1

MEDIA: B, SUPPL, VT

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. The student will make a shop drawing given a pencil, paper, T-square, drawing board, triangle, and a ruler.

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------|
| 1. GENERAL DRAFTING | FM 5-553 |
| 2. SHOP DRAWINGS | ST 9-166 |
| 3. WELDING THEORY AND APPLICATION | TC 9-237 |
| 4. SHOP MATH | TC 9-515 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAF

HOURS: 2.00

TITLE: LAY OUT A WORKPIECE

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	2.00	8:1

MEDIA: SUPPL

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. Given layout tools, equipment, metal, and a drawing, the student will lay out a workpiece.

REFERENCE

REFERENCE #

1. SHOP DRAWINGS

ST 9-166

2. FUNDAMENTALS OF MACHINE TOOLS

TC 9-524

3. General Drafting

TM 9-243

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAG

HOURS: 1.00

TITLE: SHARPEN A TWIST DRILL

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.50	8:1
L	0.50	8:1

MEDIA: AIO, SUPPL, VT

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. Given a utility grinder and twist drills, the instructor will demonstrate the proper procedures to sharpen twist drills.

REFERENCE

REFERENCE #

1. FUNDAMENTALS OF MACHINE TOOLS

TC 9-524

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAH

HOURS: 3.00

TITLE: OPERATE A DRILL PRESS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.50	8:1
L	0.50	8:1
PA	2.00	8:1

MEDIA: AIO, SUPPL

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. Given a drill press, twist drills, and metal, the student will perform drilling operations.

REFERENCE

REFERENCE #

1. FUNDAMENTALS OF MACHINE TOOLS

TC 9-524

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXAAJ

HOURS: 2.00

TITLE: OSHA HAZARD COMMUNICATION STANDARD

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	2.00	8:1

MEDIA: B, S, SUPPL, VT

LESSON PURPOSE:

This lesson is regulated by ITRO doctrine and is required by all ITRO students. Although this lesson has no 1316 ITS to follow it is necessary instruction to ensure the entry level student can attain the knowledge necessary to continue with current POI. Students attain knowledge in the goals, chain of command responsibilities of the OSHA Hazard Communication Standard, identification of physical and health hazards and identification, preventive measures and personal protective equipment.

REFERENCE

REFERENCE #

1. DOD FEDERAL HAZARD COMMUNICATION TRAINING

6050-5W

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

EXAM ID: SWXAAAN

HOURS: 21.20

TITLE: JOB KNOWLEDGE TEST

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
CE	2.00	8:1
D	0.50	8:1
D	1.00	8:1
D	4.50	8:1
D	1.00	8:1
L	0.50	8:1
L	7.00	8:1
PA	3.00	8:1
PA	0.50	8:1
PA	1.00	8:1
PA	0.20	8:1

MEDIA: AIO, AIO, AIO, AIO, AIO, AIO, B, B, CPU, HO, VCR, VT, VT, VT, VT, VT, VT, WBK, WBK, WBK, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)
2. Provided a welding facility, oxyacetylene equipment, job specifications, and references, CUT CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.05)
3. Provided a welding facility, oxyacetylene equipment, job specifications, and references Weld sheet metal with Oxyacetylene equipment To meet job specifications per the reference. (1316.02.06)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided oxyacetylene welding equipment, tools and supplemental training materials. Perform setup operations following all shop safety procedures and adjust torch to the 3 basic flames. In accordance with TM-237 and current edition of Modern Welding (1316.02.02a)
2. With the aid of references and provided oxyacetylene equipment, 1/8" steel plate and safety equipment. Weld stringer beads in the flat position with and without filler rod. In accordance with TM-237 and current edition of Modern Welding. (1316.02.02b)
3. With the aid of references and given oxyacetylene torch outfit, 1/8" steel plate, filler rod and safety equipment. Weld a "Butt" and "TEE" joint in the flat position. In accordance with TM-237 and current edition of Modern Welding. (1316.02.02c)
4. With the aid of references and given oxyacetylene welding equipment, 1/8" steel

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

EXAM ID: SWXAAAN

HOURS: 21.20

TITLE: JOB KNOWLEDGE TEST

plate, filler rod, and appropriate safety equipment. Weld a "Butt" and "TEE" joint in the vertical position. In accordance with TM 9-237 and current edition of Modern Welding. (1316.02.02e)

5. With the aid of references and given oxyacetylene welding equipment, 1/8" steel plate, filler rod and appropriate safety equipment. Weld a "Butt" and "TEE" joint in the horizontal position. In accordance with TM-9-237 and current edition of Modern Welding. (1316.02.02d)
6. With the aid of references and given oxyacetylene welding equipment, 1/8" steel plate, filler rod and appropriate safety equipment. Weld a "Butt" and "TEE" joint in the overhead position. In accordance with TM 9-237 and current edition of Modern Welding. (1316.02.02f)
7. With the aid of reference and given oxyacetylene welding equipment, necessary tools and equipment, brazing rod, carbon steel coupons and brazing flux braze weld carbon steel in accordance with Modern Welding 1997 edition and TM 9-237. (1316.02.02g)
8. With the aid of references and given oxyacetylene torch outfit and cutting torch attachments properly setup and adjust flame for proper cut in accordance with MODERN WELDING 1997 edition and TM 9-237. (1316.02.05a)
9. With the aid of references and given oxyacetylene torch outfit and cutting torch attachments properly demonstrate straight and 45 degree bevel cuts on mild steel plate in accordance with MODERN WELDING 1997 edition and TM 9-237. (1316.02.05b)

REFERENCE

REFERENCE #

- | | |
|---|----------------------|
| 1. DOD FEDERAL HAZARD COMMUNICATION TRAINING | 6050-5W |
| 2. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 3. Manufacturer's owner's manual | CIVILIAN |
| 4. GENERAL DRAFTING | FM 5-553 |
| 5. Use and Care of Hand Tools and Measuring Tools | FM 9-243 |
| 6. WELDING THEORY AND APPLICATION | TC 9-237 |
| 7. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX A - SHOP FUNDAMENTALS

LESSON ID: SWXHAA

HOURS: 2.00

TITLE: RESPIRATOR PROTECTION

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	2.00	8:1

MEDIA: AIO, B, HO, TV, VCR, VT

LESSON PURPOSE:

Given instructions on respiratory protection, the student will receive training on the safety standards of respiratory protection and comply with the standards.

REFERENCE

REFERENCE #

1. OCCUPATIONAL SAFETY AND HEALTH STANDARDS, HAZARD COMMUNICATION

29 CFR 1910.1200

2. A guide to respiratory protection

PAMPHLET 11046

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAA

HOURS: 4.00

TITLE: SET UP OXYACETYLENE WELDING AND CUTTING EQUIP. ADJUST 3 BASIC FLAMES

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	1.00	8:1
L	1.00	8:1
PA	2.00	8:1

MEDIA: AIO, B, SUPPL, TV, VCR, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided oxyacetylene welding equipment, tools and supplemental training materials. Perform setup operations following all shop safety procedures and adjust torch to the 3 basic flames. In accordance with TM-237 and current edition of Modern Welding (1316.02.02a)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAB

HOURS: 3.00

TITLE: STRING BEADS WITH AND WITHOUT ROD

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	2.75	4:1

MEDIA: AIO, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided oxyacetylene equipment, 1/8" steel plate and safety equipment. Weld stringer beads in the flat position with and without filler rod. In accordance with TM-237 and current edition of Modern Welding. (1316.02.02b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAC

HOURS: 10.00

TITLE: FLAT POSITION MILD STEEL WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, SUPPL, TV, VCR, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given oxyacetylene torch outfit, 1/8" steel plate, filler rod and safety equipment. Weld a "Butt" and "TEE" joint in the flat position. In accordance with TM-237 and current edition of Modern Welding. (1316.02.02c)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAD

HOURS: 10.00

TITLE: HORIZONTAL POSITION MILD STEEL WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, SUPPL, TV, VCR, VT

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given oxyacetylene welding equipment, 1/8" steel plate, filler rod and appropriate safety equipment. Weld a "Butt" and "TEE" joint in the horizontal position. In accordance with TM-9-237 and current edition of Modern Welding. (1316.02.02d)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXB AE

HOURS: 10.00

TITLE: VERTICAL POSITION MILD STEEL WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, SUPPL, TV, VCR, VT

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given oxyacetylene welding equipment, 1/8" steel plate, filler rod, and appropriate safety equipment. Weld a "Butt" and "TEE" joint in the vertical position. In accordance with TM 9-237 and current edition of Modern Welding. (1316.02.02e)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAF

HOURS: 13.00

TITLE: OVERHEAD POSITION MILD STEEL WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	12.75	4:1

MEDIA: AIO, VT

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given oxyacetylene welding equipment, 1/8" steel plate, filler rod and appropriate safety equipment. Weld a "Butt" and "TEE" joint in the overhead position. In accordance with TM 9-237 and current edition of Modern Welding. (1316.02.02f)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAG

HOURS: 10.00

TITLE: WELD THIN SHEET METAL

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, VT

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a welding facility, oxyacetylene equipment, job specifications, and references Weld sheet metal with Oxyacetylene equipment To meet job specifications per the reference. (1316.02.06)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|---------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE,TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TC 9-237 |
| 4. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAH

HOURS: 4.00

TITLE: BRAZING OPERATIONS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	3.75	4:1

MEDIA: AIO, B, VCR, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of reference and given oxyacetylene welding equipment, necessary tools and equipment, brazing rod, carbon steel coupons and brazing flux braze weld carbon steel in accordance with Modern Welding 1997 edition and TM 9-237. (1316.02.02g)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAL

HOURS: 4.00

TITLE: SOLDERING OPERATIONS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	3.75	4:1

MEDIA: AIO, B, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided oxyacetylene welding equipment, radiator/fuel tank, patching material, solder, flux, soldering iron, water and compressed air supplies, appropriate tools and references. Repair Radiators/Fuel Tanks To ensure welds show proper tinning and bonding, will not leak, and will maintain appropriate pressure per the references. (1316.07.01)

REFERENCE

REFERENCE #

1. MODERN WELDING-1997

ALTHOUSE, TURNQUIST,

2. WELDING THEORY AND APPLICATION

TM 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

LESSON ID: SWXBAJ

HOURS: 14.00

TITLE: OXYACETYLENE CUTTING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	1.00	4:1
PA	13.00	4:1

MEDIA: AIO, B

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a welding facility, oxyacetylene equipment, job specifications, and references, CUT CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.05)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given oxyacetylene torch outfit and cutting torch attachments properly setup and adjust flame for proper cut in accordance with MODERN WELDING 1997 edition and TM 9-237. (1316.02.05a)
2. With the aid of references and given oxyacetylene torch outfit and cutting torch attachments properly demonstrate straight and 45 degree bevel cuts on mild steel plate in accordance with MODERN WELDING 1997 edition and TM 9-237. (1316.02.05b)

REFERENCE

REFERENCE #

1. MODERN WELDING-1997

ALTHOUSE,TURNQUIST,

2. WELDING THEORY AND APPLICATION

TM 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX B - OXYACETYLENE WELDING AND CUTTING OPERATIONS

EXAM ID: SWXBAK

HOURS: 8.00

TITLE: JOB KNOWLEDGE / PERFORMANCE TEST

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
CE	1.00	8:1
X(P)	7.00	8:1

MEDIA: AIO, CPU, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided OxyAcetylene welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH OXYACETYLENE EQUIPMENT to meet job specifications per the reference. (1316.02.02)

REFERENCE

REFERENCE #

1. MODERN WELDING-1997

ALTHOUSE, TURNQUIST,

2. WELDING THEORY AND APPLICATION

TM 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

LESSON ID: SWXCAA

HOURS: 1.00

TITLE: IDENTIFICATION AND USE OF ELECTRODES

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	1.00	8:1

MEDIA: AIO, B, HO, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)
2. Provided shielded metal arc welding equipment, cast steel, job specifications and references, WELD CAST STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.06)

ENABLING LEARNING OBJECTIVE(S):

1. Provided a classroom, student workbook and variety of electrodes identify the use of each electrode by deciphering the numeric code given on each in accordance with Modern Welding 1997 edition and TM 9-237. (1316.03.01a)
2. With the aid of references and given a classroom environment determine the characteristics and use's for cast steels in accordance with Modern Welding 1997 edition and TM 9-237. (1316.03.06a)
3. With the aid of references and given a classroom environment determine the proper preparation and welding of cast steels in accordance with Modern Welding 1997 edition and TM 9-237. (1316.03.06b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

LESSON ID: SWXCAB

HOURS: 1.00

TITLE: SET UP OF SHIELDED METAL ARC WELDING (SMAW) EQUIPMENT

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.50	4:1
PA	0.50	4:1

MEDIA: AIO, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided with Shielded Metal Arc Welding equipment identify and properly setup SMAW equipment in accordance with appropriate manufacturer's owners manuals, Modern Welding 1997 edition and TM 9-237. (1316.03.01b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

LESSON ID: SWXCAC

HOURS: 10.00

TITLE: STRING, WEAVE BEADS AND SURFACE BUILDUP

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/4" thick carbon steel coupon, safety equipment and electrodes weld stringer and weave beads in the flat position in accordance with appropriate manufacturer's owners manuals, Modern Welding 1997 edition and TM 9-237. (1316.03.01c)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

LESSON ID: SWXCAD

HOURS: 10.00

TITLE: FLAT POSITION SMAW WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, CPU, TV, VCR, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)
2. Provided a welding facility, welding equipment, metal and references, PERFORM FOREHAND/BACKHAND WELDING To meet job specifications per the references. (1316.06.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT joints in the FLAT position in accordance with appropriate manufacturer's owners manuals, Modern Welding 1997 edition and TM 9-237. (1316.03.01d)
2. With the aid of references and given the necessary tools, materials and equipment perform Forehand welding in accordance with the references. (1316.06.02a)
3. With the aid of references and given the necessary tools, materials and equipment perform Backhand welding in accordance with the references. (1316.06.02b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TC 9-237 |
| 4. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

LESSON ID: SWXCAE

HOURS: 17.00

TITLE: HORIZONTAL POSITION SMAW WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	16.75	4:1

MEDIA: AIO, B, TV, VCR, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT and TEE joints in the HORIZONTAL position in accordance with the references (1316.03.01e)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

LESSON ID: SWXCAF

HOURS: 17.00

TITLE: VERTICAL POSITION SMAW WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	16.75	4:1

MEDIA: AIO, B, TV, VCR, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT and TEE joints in the VERTICAL position in accordance with the references (1316.03.01f)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

LESSON ID: SWXCAG

HOURS: 17.00

TITLE: OVERHEAD POSITION SMAW WELDING

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	16.75	4:1

MEDIA: AIO, B, TV, VCR, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT and TEE joints in the OVERHEAD position in accordance with the references (1316.03.01g)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

EXAM ID: SWXCAJ

HOURS: 7.00

TITLE: JOB KNOWLEDGE / PERFORMANCE TEST

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
CE	1.00	8:1
PA	6.00	8:1

MEDIA: CPU, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. Provided a classroom, student workbook and variety of electrodes identify the use of each electrode by deciphering the numeric code given on each in accordance with Modern Welding 1997 edition and TM 9-237. (1316.03.01a)
2. With the aid of references and provided with Shielded Metal Arc Welding equipment identify and properly setup SMAW equipment in accordance with appropriate manufacturer's owners manuals, Modern Welding 1997 edition and TM 9-237. (1316.03.01b)
3. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/4" thick carbon steel coupon, safety equipment and electrodes weld stringer and weave beads in the flat position in accordance with appropriate manufacturer's owners manuals, Modern Welding 1997 edition and TM 9-237. (1316.03.01c)
4. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT joints in the FLAT position in accordance with appropriate manufacturer's owners manuals, Modern Welding 1997 edition and TM 9-237. (1316.03.01d)
5. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT and TEE joints in the HORIZONTAL position in accordance with the references (1316.03.01e)
6. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT and TEE joints in the VERTICAL position in accordance with the references (1316.03.01f)
7. With the aid of references and provided with Shielded Metal Arc Welding equipment, 1/2" thick carbon steel coupon, safety equipment and electrodes weld BUTT and TEE joints in the OVERHEAD position in accordance with the references (1316.03.01g)

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX C - SHIELDED METAL ARC WELDING (SMAW)

EXAM ID: SWXCAJ

HOURS: 7.00

TITLE: JOB KNOWLEDGE / PERFORMANCE TEST

REFERENCE

REFERENCE #

1. MODERN WELDING-1997

ALTHOUSE, TURNQUIST,

2. Manufacturer's owner's manual

CIVILIAN

3. WELDING THEORY AND APPLICATION

TM 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBA

HOURS: 7.00

TITLE: SET UP AND OPERATION OF GAS METAL ARC WELDING (GMAW) EQUIPMENT

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	8:1
L	1.75	8:1
PA	5.00	4:1

MEDIA: AIO, B, HO, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, material and equipment properly setup Gas Metal Arc Welding equipment for Aluminum welding in accordance with appropriate civilian equipment owners manuals and Modern Welding 1997 edition. (1316.04.03a)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBB

HOURS: 8.00

TITLE: GMAW FLAT POSITON

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	7.75	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, material and equipment weld aluminum in the FLAT position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBC

HOURS: 8.00

TITLE: GMAW HORIZONTAL POSITON

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	7.75	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, material and equipment weld aluminum in the HORIZONTAL position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03d)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBD

HOURS: 11.00

TITLE: GMAW VERTICAL POSITION

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	10.75	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, material and equipment weld aluminum in the VERTICAL position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03c)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDDE

HOURS: 11.00

TITLE: GMAW OVERHEAD POSITION

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	10.75	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, material and equipment weld aluminum in the OVERHEAD position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03e)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBF

HOURS: 10.00

TITLE: SOLID CORE WELDING MILD STEEL

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided necessary tools and equipment perform proper setup and operation techniques and weld CARBON(mild) steel using SOLID CORE filler metal in accordance with Civilian Manufacturer's Owner's Manuals, Modern Welding 1997 edition and TM 9-237. (1316.04.01a)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|---------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE,TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBG

HOURS: 10.00

TITLE: FLUX CORE WELDING MILD STEEL

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	9.75	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools and equipment weld CARBON(mild) STEEL using FLUX CORE filler metal in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.01b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|---------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE,TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

EXAM ID: SWXDBH

HOURS: 8.00

TITLE: JOB KNOWLEDGE / PERFORMANCE TEST

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
CE	1.00	8:1
PA	7.00	8:1

MEDIA: AIO, B, CPU

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, carbon steel, job specifications and references, WELD CARBON STEEL WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.01)
2. Provided gas metal arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided necessary tools and equipment perform proper setup and operation techniques and weld CARBON(mild) steel using SOLID CORE filler metal in accordance with Civilian Manufacturer's Owner's Manuals, Modern Welding 1997 edition and TM 9-237. (1316.04.01a)
2. With the aid of references and given the necessary tools and equipment weld CARBON(mild) STEEL using FLUX CORE filler metal in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.01b)
3. With the aid of references and given the necessary tools, material and equipment properly setup Gas Metal Arc Welding equipment for Aluminum welding in accordance with appropriate civilian equipment owners manuals and Modern Welding 1997 edition. (1316.04.03a)
4. With the aid of references and given the necessary tools, material and equipment weld aluminum in the FLAT position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03b)
5. With the aid of references and given the necessary tools, material and equipment weld aluminum in the VERTICAL position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03c)
6. With the aid of references and given the necessary tools, material and equipment weld aluminum in the HORIZONTAL position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03d)
7. With the aid of references and given the necessary tools, material and equipment

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

EXAM ID: SWXDBH

HOURS: 8.00

TITLE: JOB KNOWLEDGE / PERFORMANCE TEST

weld aluminum in the OVERHEAD position in accordance with Modern Welding 1997 edition and TM 9-237. (1316.04.03e)

REFERENCE

REFERENCE #

1. MODERN WELDING-1997

ALTHOUSE, TURNQUIST,

2. Manufacturer's owner's manual

CIVILIAN

3. WELDING THEORY AND APPLICATION

TM 9-237

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBI

HOURS: 2.00

TITLE: SET UP AND OPERATION OF GAS TUNGSTEN ARC WELDING (GTAW) EQUIPMENT

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	1.75	4:1

MEDIA: AIO, B, HO, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas tungsten arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS TUNGSTEN ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.05.04)
2. Provided gas tungsten arc welding equipment, alloy steel, job specifications and referneces, WELD ALLOY STEEL WITH GAS TUNGSTEN ARC WELDING EQUIPMENT To meet job specifications per the referneces. (1316.05.03)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, materials and equipment setup Gas Tungsten Arc Welding equipment for use in Aluminum welding in accordance with the references (1316.05.04a)
2. With the aid of references and given the necessary tools, materials and equipment setup Gas Tungsten Arc Welding equipment for use in welding Alloy Steels in accordance with the referneces (1316.05.03a)
3. With the aid of references and given the necessary tools, materials and equipment weld Alloy Steels with Gas Tungsten Arc Welding equipment in accordance with the references (1316.05.03b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBJ

HOURS: 21.00

TITLE: GTAW ALUMINUM

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	1.00	4:1
PA	20.00	4:1

MEDIA: AIO, B, TV, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas tungsten arc welding equipment, aluminum, job specifications and references, WELD ALUMINUM WITH GAS TUNGSTEN ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.05.04)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, materials and equipment weld aluminum in the FLAT position with Gas Tungsten Arc Welding equipment in accordance with the references (1316.05.04b)
2. With the aid of references and given the necessary tools, materials and equipment weld aluminum in the HORIZONTAL position with Gas Tungsten Arc Welding equipment in accordance with the references (1316.05.04c)
3. With the aid of references and given the necessary tools, materials and equipment weld aluminum in the VERTICAL position with Gas Tungsten Arc Welding equipment in accordance with the references (1316.05.04d)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|---------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE,TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

LESSON ID: SWXDBK

HOURS: 13.00

TITLE: GTAW STAINLESS STEEL

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	4:1
PA	12.75	4:1

MEDIA: AIO, B, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas metal arc welding equipment, stainless steel, job specifications and references. Weld stainless steel with Gas Metal Arc Welding equipment To meet job specifications per the references. (1316.04.04)
2. Provided gas tungsten arc welding equipment, stainless steel, job specifications and the references WELD STAINLESS STEEL WITH GAS TUNGSTEN ARC WELDING EQUIPMENT to meet job specifications per the reference (1316.05.05)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, material and equipment setup Gas Metal Arc Welding equipment for use in Stainless Steel welding in accordance with the references. (1316.04.04a)
2. With the aid of references and given the necessary tools, material and equipment weld Stainless Steel in accordance with the references. (1316.04.04b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX D - GAS METAL ARC WELDING (GMAW) AND GAS TUNGSTEN ARC WELDING (GTAW)

EXAM ID: SWXDBL

HOURS: 6.80

TITLE: JOB KNOWLEDGE / PERFORMANCE TEST

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
CE	1.00	8:1
D	1.80	4:1
D	1.00	8:1
PA	1.00	4:1
PA	2.00	8:1

MEDIA: AIO, B, B, CPU, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided gas tungsten arc welding equipment, stainless steel, job specifications and the references WELD STAINLESS STEEL WITH GAS TUNGSTEN ARC WELDING EQUIPMENT to meet job specifications per the reference (1316.05.05)

ENABLING LEARNING OBJECTIVE(S):

1. Provided with gas tungsten Arc welding equipment Prepare and tack weld stainless steel In accordance with TC 9-237, Modern Welding Technology (1316.05.05a)

REFERENCE

REFERENCE #

- | | |
|--|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. MODERN WELDING TECHNOLOGY-4TH EDITION | HOWARD B. CARY. |
| 4. WELDING THEORY AND APPLICATION | TC 9-237 |
| 5. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX E - ARMOR PLATE WELDING

LESSON ID: SWXEBA

HOURS: 77.00

TITLE: SMAW ARMOR PLATE

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	8.00	8:1
L	8.00	8:1
PA	61.00	4:1

MEDIA: AIO, B, CPU, HO, M, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, armor plate, job specifications and references, prepare, weld and inspect Armor plate to meet job specifications per the references. (1316.03.07)

 DOWNGRADE JUSTIFICATION: MCO 1510.95A

2. Provided a welding facility, plasma arc cutting equipment, material to cut, job specifications, and the references, CUT METAL WITH PLASMA ARC EQUIPMENT to meet job specifications per the references. (1316.01.03)
3. Provided shielded metal arc welding equipment, alloy steel, job specifications and references, WELD ALLOY STEELS WITH SHIELDED METAL ARC WELDING EQUIPMENT to meet job specifications per the references. (1316.03.03)
4. Provided gas metal arc welding equipment, alloy steel, job specifications and references, WELD ALLOY STEEL WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.02)
5. Provided gas metal arc welding equipment, armor plate, job specifications and references, WELD ARMOR PLATE WITH GAS METAL ARC WELDING EQUIPMENT To meet job specifications per the references. (1316.04.06)
6. Provided a welding facility, welding equipment, metal and the reference, PERFORM INTERMITTENT BACK STEP WELDING To meet the job specifications per the references. (1316.06.04)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary metal stack, tools and equipment prepare crack in 46100 grade Armor plate in accordance with TM 08594A-25/1. (1316.03.07a)
2. With the aid of references and given the necessary metal stack, tools and equipment weld crack in 46100 grade Armor plate in accordance with TM 08594A-25/1. (1316.03.07b)
3. With the aid of references and given the necessary metal stack, tools and equipment inspect weld in 46100 grade Armor plate in accordance with TM 08594A-25/1. (1316.03.07c)

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX E - ARMOR PLATE WELDING

LESSON ID: SWXEBA

HOURS: 77.00

TITLE: SMAW ARMOR PLATE

4. With the aid of references in a classroom environment describe the differences, identification and weldability of alloy steels in accordance with Modern Welding 1997 edition and TM 9-237. (1316.03.03a)

5. With the aid of references and given Shielded Metal Arc Welding (SMAW) equipment, alloy steels and appropriate safety equipment properly prepare and weld alloy steel in accordance with Modern Welding 1997 edition and TM 9-237. (1316.03.03b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TC 9-237 |
| 4. LAV WELDING | TM 08594A-23/1 |
| 5. LAV WELDING | TM 08594A-45/2 |
| 6. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX E - ARMOR PLATE WELDING

EXAM ID: SWXEBH

HOURS: 37.00

TITLE: SMAW ARMOR PLATE JOB KNOWLEDGE / PERFORMANCE EXAM

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
CBT	1.00	8:1
CE	1.00	8:1
D	3.00	8:1
D	2.00	8:1
D	0.10	8:1
D	0.20	8:1
L	1.50	8:1
PA	3.50	8:1
PA	10.00	8:1
PA	0.90	8:1
PA	1.80	8:1
X(P)	12.00	4:1

MEDIA: AIO, B, CPU, HO, M, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided shielded metal arc welding equipment, armor plate, job specifications and references, prepare, weld and inspect Armor plate to meet job specifications per the references. (1316.03.07)

 DOWNGRADE JUSTIFICATION: MCO 1510.95A

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary metal stack, tools and equipment prepare crack in 46100 grade Armor plate in accordance with TM 08594A-25/1. (1316.03.07a)
2. With the aid of references and given the necessary metal stack, tools and equipment weld crack in 46100 grade Armor plate in accordance with TM 08594A-25/1. (1316.03.07b)
3. With the aid of references and given the necessary metal stack, tools and equipment inspect weld in 46100 grade Armor plate in accordance with TM 08594A-25/1. (1316.03.07c)

REFERENCE

REFERENCE #

- | | |
|---|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. WELDING THEORY AND APPLICATION | TC 9-237 |
| 3. LAV WELDING | TM 08594A-23/1 |
| 4. WELDING PROCESURES FOR LIGHT ARMORED VEHICLE | TM 08594A-25/1A |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX E - ARMOR PLATE WELDING

EXAM ID: SWXEBH

HOURS: 37.00

TITLE: SMAW ARMOR PLATE JOB KNOWLEDGE / PERFORMANCE EXAM

5. LAV WELDING

TM 08594A-45/2

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBA

HOURS: 10.00

TITLE: NAVMC RECORDS AND FORMS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	8.00	8:1
PA	2.00	8:1

MEDIA: AIO, B, CPU, HO, SUPPL, TV

TERMINAL LEARNING OBJECTIVE(S):

1. Provided necessary forms [NAVMC 10245/10925], appropriate equipment technical manual(s) , and references. Complete Equipment Repair Order and Equipment Repair Order Shopping Transaction Llist To ensure relevant records are completed per type of service performed and the references. (1316.08.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references state the publications where you would find information of completing the NAVMC 10245 and the NAVMC 10925 in accordance with the references (1316.08.02a)
2. With the aid of references state the difference between a Technical Manual (TM), Training Circular (TC), SL-3 and SL-4 publications in accordance with the references (1316.08.02b)
3. With the aid of references and given assigned tools and applicable equipment state, identify, and completely fill out the NAVMC 10245 in accordance with the references (1316.08.02c)
4. With the aid of references and given assigned tools and applicable equipment state, identify, and completely fill out the NAVMC 10925 in accordance with the references (1316.08.02d)

REFERENCE

REFERENCE #

- | | |
|---------------------------------------|---------------|
| 1. MIMMS (AIS) FMSS | UM 4790-5 |
| 2. GROUND EQUIPMENT RECORD PROCEDURES | TM 4700-15/1H |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

EXAM ID: SNXLBB

HOURS: 1.00

TITLE: NAVMC RECORDS AND FORMS EXAM

METHOD HOURS S:I RATIO

X(W) 1.00 8:1

MEDIA: AIO, B, CPU, HO, SUPPL, TV

TERMINAL LEARNING OBJECTIVE(S):

1. Provided necessary forms [NAVMC 10245/10925], appropriate equipment technical manual(s) , and references. Complete Equipment Repair Order and Equipment Repair Order Shopping Transaction Llist To ensure relevant records are completed per type of service performed and the references. (1316.08.02)

REFERENCE

REFERENCE #

1. MIMMS (AIS) FMSS

UM 4790-5

2. GROUND EQUIPMENT RECORD PROCEDURES

TM 4700-15/1H

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBC

HOURS: 4.00

TITLE: GTAW TITANIUM

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	4.00	8:1

MEDIA: AIO, B, CPU, HO, TV

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a welding facility, gas tungsten arc welding equipment, job specifications, and references. Weld Titanium with Gas Tungsten Arc Welding equipment. To meet job specifications per the references. (1316.05.07)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, materials and equipment describe metal properties of titanium and its weldability in accordance with the references. (1316.05.07a)
2. With the aid of references and given the necessary tools, materials and equipment describe proper setup and equipment required to GTAW titanium in accordance with the references. (1316.05.07b)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TC 9-237 |
| 4. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBD

HOURS: 8.00

TITLE: METAL SHEAR OPERATIONS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	0.25	8:1
L	0.25	8:1
PA	7.50	2:1

MEDIA: AIO, HO

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a welding facility, metal shear, materials to cut and the references, CUT SHEET METAL WITH METAL SHEER to ensure sheet metal is cut safely and accurately to specification. (1316.01.02)

ENABLING LEARNING OBJECTIVE(S):

1. Given the student handout, necessary tools and equipment identify the characteristics of an automatic and manual shear in accordance with the reference (1316.01.02a)
2. Given the student handout, necessary tools and equipment identify the danger zones of a shear and the PPE necessary for shear operations in accordance with the reference (1316.01.02b)
3. Given the student handout, necessary tools and equipment conduct shearing operations in accordance with the reference (1316.01.02c)

REFERENCE

REFERENCE #

1. MODERN WELDING-1997

ALTHOUSE, TURNQUIST,

2. Manufacturer's owner's manual

CIVILIAN

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBE

HOURS: 4.00

TITLE: RADIATOR AND FUEL TANK REPAIR

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	4.00	8:1

MEDIA: AIO, B, VT, WBK

TERMINAL LEARNING OBJECTIVE(S):

1. Provided oxyacetylene welding equipment, radiator/fuel tank, patching material, solder, flux, soldering iron, water and compressed air supplies, appropriate tools and references. Repair Radiators/Fuel Tanks To ensure welds show proper tinning and bonding, will not leak, and will maintain appropriate pressure per the references. (1316.07.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given the necessary tools, materials and equipment perform radiator repair in accordance with the references (1316.07.01a)
2. With the aid of references and given the necessary tools, materials and equipment perform fuel tank repair in accordance with the references (1316.07.01b)

REFERENCE

REFERENCE #

- | | |
|---|----------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE, TURNQUIST, |
| 2. METAL BODY REPAIR AND RELATED OPERATIONS | FM 43-2 |
| 3. TACTICAL VEHICLE COOLING SYSTEMS | TM 750-254 |
| 4. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBF

HOURS: 8.00

TITLE: CONDUCT SAFETY INSPECTIONS

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	4.00	8:1
PA	4.00	8:1

MEDIA: B, CPU, HO, TV, VCR, VT

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a job site with working personnel to inspect and references. CONDUCT SAFETY INSPECTIONS To identify safety discrepancies per the reference. (1316.01.07)

ENABLING LEARNING OBJECTIVE(S):

1. Given the student handout and in a classroom environment discuss the Military Unit Safety Program in accordance with MCO P5100.8F. (1316.01.07a)
2. Given the student handout and in a classroom environment discuss Councils and Committees in accordance with MCO P5100.8F. (1316.01.07b)
3. Given the student handout and in a classroom environment discuss Training standards in accordance with MCO P5100.8F. (1316.01.07c)
4. Given the student handout and in a classroom environment discuss workplace safety inspections and corrective action in accordance with MCO P5100.8F. (1316.01.07d)
5. Given the student handout and in a classroom environment discuss reports and appeals of unsafe or unhealthful working conditions in accordance with MCO P5100.8F. (1316.01.07e)
6. Given the student handout and in a classroom environment discuss prevention and control of workplace hazards in accordance with MCO P5100.8F. (1316.01.07f)
7. Given the student handout and in a classroom environment discuss occupational health and industrial hygiene programs in accordance with MCO P5100.8F. (1316.01.07g)
8. Given the student handout and in a classroom environment discuss lockout/tagout programs in accordance with MCO P5100.8F. (1316.01.07h)
9. Given the student handout and in a classroom environment discuss confined space entry program in accordance with MCO P5100.8F. (1316.01.07j)

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBF

HOURS: 8.00

TITLE: CONDUCT SAFETY INSPECTIONS

10. Given the student handout and in a classroom environment discuss Personal Protective Equipment (PPE) in accordance with MCO P5100.8F. (1316.01.07i)

11. Given the student handout and in a classroom environment discuss hazardous materials control in accordance with MCO P5100.8F. (1316.01.07k)

REFERENCE

REFERENCE #

- | | |
|--|------------|
| 1. MARINE CORPS GROUND OCCUPATIONAL SAFETY AND HEALTH (OSH) PROGRAM. | MCO 5100.8 |
|--|------------|

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

EXAM ID: SNXLBG

HOURS: 1.00

TITLE: SAFETY INSPECTIONS JOB KNOWLEDGE TEST

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
X(W)	1.00	8:1

MEDIA: AIO

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a job site with working personnel to inspect and references. CONDUCT SAFETY INSPECTIONS To identify safety discrepancies per the reference. (1316.01.07)

REFERENCE

REFERENCE #

1. MARINE CORPS GROUND OCCUPATIONAL SAFETY AND HEALTH (OSH) PROGRAM.

MCO 5100.8

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBH

HOURS: 7.00

TITLE: SL-3 INVENTORY

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
L	1.00	8:1
PA	6.00	8:1

MEDIA: AIO, B, CPU, HO, TV

TERMINAL LEARNING OBJECTIVE(S):

1. Provided tool sets, chests, kits, and referneces. Conduct inventory of tools sets, chests, and kits. To reconcile the inventory list for accountability and serviceability. (1316.10.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given SL-3 04055C and inventory sheet identify the necessary frequency of inventories in accordance with the references. (1316.10.02a)
2. Given the SL-3 04055C and the SL-3 extract identify each part of the Hobart Welder took kit in accordance with the references. (1316.10.02b)
3. Given the SL-3 inventory folder for the Hobart Welder Trailer properly fill in all of the blanks and sign the inventoried by block in accordance with the references. (1316.10.02c)
4. Given lesson plan SWXLAG (NAVMC records and forms) complete an SL-3 ERO and EROSL for missing tools in accordance with the reference (1316.10.02d)

REFERENCE

REFERENCE #

- | | |
|--|---------------|
| 1. MIMMS FIELD PROCEDURES MANUAL | MCO P4790.2C |
| 2. SL-3 for DCC 353P Hobart Welder/Trailer | SL-3-04055C |
| 3. GROUND EQUIPMENT RECORD PROCEDURES | TM 4700-15/1H |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

EXAM ID: SNXLBI

HOURS: 1.00

TITLE: SL-3 INVENTORY JOB KNOWLEDGE EXAM

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
X(W)	1.00	8:1

MEDIA: HO

TERMINAL LEARNING OBJECTIVE(S):

1. Provided tool sets, chests, kits, and referneces. Conduct inventory of tools sets, chests, and kits. To reconcile the inventory list for accountability and serviceability. (1316.10.02)

REFERENCE

REFERENCE #

1. MIMMS FIELD PROCEDURES MANUAL

MCO P4790.2C

2. GROUND EQUIPMENT RECORD PROCEDURES

TM 4700-15/1H

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBJ

HOURS: 12.00

TITLE: HOBART WELDER/TRAILER

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
D	2.00	8:1
L	2.00	8:1
PA	8.00	8:1

MEDIA: AIO, HO

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a welding facility, welding / cutting equipment, and the references, PERFORM OPERATIONS CHECKS ON WELDING/CUTTING EQUIPMENT to ensure safe operating conditions per the references. (1316.01.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and provided welding equipment, consolidated engineer equipment log, service record log (NAVMC 10524). Perform "Before" operations service's on equipment. In accordance with TM-04055-15/1. (1316.01.01a)
2. With the aid of references and provided appropriate equipment, consolidated engineer equipment log and service record (NAVMC 10524). Perform "During" operations services on equipment. In accordance with TM-04055C-15/1. (1316.01.01b)
3. With the aid of references and provided appropriate equipment, consolidated engineer equipment log and service record (NAVMC 10524). Perform "After" services on equipment. In accordance with TM-04055C-15/1. (1316.01.01c)
4. With the aid of references and provided a Hobart DCC 353P welding machine, metal workers tool kit and safety equipment. Properly assemble the welding equipment for SMAW welding and GMAW welding. In accordance with TM 04055C-15/1 and the SL-3 04055C. (1316.01.01d)
5. With the aid of references and provided a Hobart DCC-353P welding machine, metal workers tool kit and safety equipment. Properly disassemble all welding equipment. In accordance with TM 04055C-15/1 and TC 9-237. (1316.01.01e)

REFERENCE

REFERENCE #

- | | |
|---|----------------|
| 1. Manufacturer's owner's manual | CIVILIAN |
| 2. SL-3 for DCC 353P Hobart Welder/Trailer | SL-3-04055C |
| 3. WELDING THEORY AND APPLICATION | TC 9-237 |
| 4. OPERATION AND MAINTENANCE INSTRUCTIONS, TRAILER MOUNTED ARC WELDING MACHINE. | TM 04055C-15/1 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBJ

HOURS: 12.00

TITLE: HOBART WELDER/TRAILER

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

EXAM ID: SNXLBK

HOURS: 13.00

TITLE: HOBART WELDER / TRAILER JOB KNOWLEDGE/PERFORMANCE EXAM

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
X(P)	12.00	8:1
X(W)	1.00	8:1

MEDIA: AIO, HO

TERMINAL LEARNING OBJECTIVE(S):

1. Provided a welding facility, welding / cutting equipment, and the references, PERFORM OPERATIONS CHECKS ON WELDING/CUTTING EQUIPMENT to ensure safe operating conditions per the references. (1316.01.01)

REFERENCE

REFERENCE #

- | | |
|---|----------------|
| 1. Manufacturer's owner's manual | CIVILIAN |
| 2. SL-3 for DCC 353P Hobart Welder/Trailer | SL-3-04055C |
| 3. WELDING THEORY AND APPLICATION | TC 9-237 |
| 4. OPERATION AND MAINTENANCE INSTRUCTIONS, TRAILER MOUNTED ARC WELDING MACHINE. | TM 04055C-15/1 |

BASIC METAL WORKER

SECTION IV - CONCEPT CARDS

ANNEX L - MARINE UNIQUE

LESSON ID: SNXLBL

HOURS: 38.00

TITLE: FABRICATE SPECIAL TOOLS AND EQUIPMENT

<u>METHOD</u>	<u>HOURS</u>	<u>S:I RATIO</u>
PA	38.00	4:1

MEDIA: AIO

TERMINAL LEARNING OBJECTIVE(S):

1. Provided welding and cutting equipment, fabricate material, job specifications, welding materials, and references. FABRICATE SPECIAL TOOLS AND METAL OBJECTS To meet the job specifications per the references. (1316.06.01)

REFERENCE

REFERENCE #

- | | |
|-----------------------------------|---------------------|
| 1. MODERN WELDING-1997 | ALTHOUSE,TURNQUIST, |
| 2. Manufacturer's owner's manual | CIVILIAN |
| 3. WELDING THEORY AND APPLICATION | TM 9-237 |

BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION V - STUDENT PERFORMANCE EVALUATION

1. SCOPE. There are two measurement methods used at the Basic MetalWorkers Course. Individual lessons are evaluated by either performance evaluation calling for the student to duplicate the job performance requirements or test items on written examinations given during class.

2. MASTERY LEARNING. The evaluative philosophy utilized in this course stresses student achievement of all learning objectives. Students must master performance exams with a 90% accuracy. Knowledge exams are computer based and students must achieve a minimum of 70% to pass.

3. EVALUATION OF STUDENTS. Each student is evaluated on each annex's learning objectives before proceeding to the next annex. This is accomplished through written and performance based exams concerning the subject material and through informal observation of student performance during practical application.

a. Written Evaluations. Knowledge-based learning objectives are evaluated by computer based written examinations given throughout the course that contain written test items.

b. Practical Application. Students will be informally evaluated and provided feedback by instructors through observation of student performance during practical applications. Instructors evaluate student performance and provide feedback and remedial instruction until mastery of the learning objectives are achieved. The student who does not master a given subject must exert more effort and will be given one additional opportunity to achieve mastery of the learning objectives through remedial instruction. It is the repsonsibility of the Basic MetalWorkers Course staff to render every assistance to each student needing help to achieve mastery.

c. Performance Evaluation. A performance test covering all performance-based learning objectives is conducted at the end of each annex. Students are evaluated via a performance checklist completed by the instructors.

d. Tests. The tests are as follows:

TEST TITLE	METHOD	TIME
Annex A(SWXAAAN)	Written	2 Hours
Annex B(SWXBAK)	Written	1 Hour
	Performance	7
Hours		
Annex C(SWXCAJ)	Written	1 Hour
	Performance	6
Hours		
Annex D(SWXDBH)	Written	1 Hour
	Performance	7
Hours		
Annex D(SWXDBL)	Written	1 Hour
	Performance	2
Hours		
Annex E(SWXEBH)	Witten	1 Hour
	Performance	12
Hours		
Annex L(SNXLB B)	Written	1 Hour
Annex L(SNXLB G)	Written	1 Hour
Annex L(SNXLB I)	Written	1 Hour
Annex L(SNXLB K)	Written	1 Hour
	Performance	
12 Hours		

BASIC METAL WORKER PROGRAM OF INSTRUCTION

SECTION VI - DISTRIBUTION LIST

<u>DISTRIBUTION</u>	<u>QUANTITY</u>
CG, MCCDC (C 461)	3
COMMARFORLANT	1
COMMARFORPAC	1
COMMARFORRES	1
American Council on Education (ACE)	1
Marine Corps Institute (MCI)	1