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ABSTRACT

Designed to assist in the selection of national priorities for the conversion of military curricula to civilian use, a study selected curricula pertinent to occupations with high growth potential and evaluated them against criteria important for curriculum conversion decisions. Procedures consisted of identification of priority occupational areas within the scope of vocational education, selection of candidate military courses for review, acquisition of course materials, and review and evaluation of materials. Some 150 military courses were identified as relating to thirty-five priority occupational areas. From these, twenty courses in allied health, environmental health, and occupational safety and health were selected for review in the first year. Course review guides were derived from an analysis of the components of vocational curriculum development as contained in contemporary Instructional Systems Design (ISD) models. Vocational education subject matter specialists, curriculum development specialists, and a commercial publisher performed the reviews. Conclusions were that military curricula (1) are available to meet curriculum needs, (2) generally have well-stated course goals and objectives but require attention to lesson objectives, (3) demonstrate a high degree of technical accuracy, and (4) usually include a variety of instructional strategies but often lack classroom management strategies. (Course descriptions, evaluations, and review guides are included.) (JT)

DEPARTMENT OF DEFENSE CURRICULA: INFORMATION CONCERNING CONVERSION FOR CIVILIAN USE

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- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

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U. S. DEPARTMENT OF
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FOREWORD

The U.S. Department of Defense is one of the foremost agencies conducting occupational training. Military training models are rigorous and thorough and produce curricula which include many occupations of importance in civilian enterprises. The possibility that some of these curricula can be converted to civilian use offers hope for substantial cost and time efficiencies in providing effective instruction to students of vocational and technical education. This report, developed by the National Center under its contract with the Bureau of Occupational and Adult Education, U.S. Office of Education, provides information designed to assist in the selection of national priorities for the conversion of military curricula to civilian use. Curricula pertinent to occupations with high growth potential are described and evaluated against criteria important for curriculum conversion decisions.

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CHAPTER 1: INTRODUCTION

Background

Since the beginning of this decade there has been an increased awareness of Department of Defense (DOD) curricula as a potentially valuable resource for civilian vocational and technical education. The U. S. military is one of the foremost agencies conducting occupational training. A publication produced by the Department of Defense has identified some 335 military occupations that have civilian counterparts (Department of Defense 1975). Recently, a leading DOD training director forecast that "By 1984 . . . most of the skills required by the armed forces will be non-military in nature" (Saturday Review 1978).

The importance and desirability of identifying and preparing military-developed technical training materials for civilian use is further supported by: the continuing need by civilian vocational educators for high quality curriculum materials; the success of the U. S. military services in training personnel for new and changing occupations; and the ability of the military services to concentrate more resources upon rigorous development of instructional materials than the civilian sector.

The 1976 Education Amendments called attention to the need for more efficiency and coordination in federal vocational and technical education curriculum development activities (U. S. Congress 1976). At least two important considerations are related to this legislative concern. First, the military training models and existing military curricula may present an opportunity for important savings of time and money in curriculum development activities. Second, recent studies, such as Lewis (1972), have reported that "current efforts used to relate the (military-developed) instruction in both public and military education programs have generally been piecemeal in nature."

The National Center for Research in Vocational Education, under a contract with the Bureau of Occupational and Adult Education (BOAE), U.S. Office of Education (USOE), is assigned one responsibility directly traceable to the legislative concern for increased coordination and utilization of military curricula by civilian vocational educators: to assemble and to present information to assist BOAE/USOE in setting national priorities for the conversion of Department of Defense products to civilian use (U.S. Office of Education 1977).

Problem

Several problems are confronted in developing information to aid in determining priorities for conversion of military curricula to civilian vocational/technical use.

A primary problem that must be resolved in addressing the conversion issue involves the establishment of criteria for determining (a) what military curricula are to be evaluated, and (b) what pertinent information is to be collected and reported for each course examined. Two appropriate criteria are available for resolving the former question:

1. Where is there a demand for instruction? Is the occupation in the civilian sector in demand? What is the labor market potential for the civilian counterpart to the military specialty or course?

2. Where is there a need for curriculum development? What is the status of curriculum for a demand occupation in the civilian sector? Is there presently curriculum available in the civilian sector?

Developmental criteria (in terms of a model of curriculum development) must be established for deciding the latter question (what information is critical to a decision on conversion?). Military curricula must be evaluated using specified standards that are recognized as reasonable and appropriate for instructional development. One approach that can be used to judge the feasibility of converting military curricula is the Instructional Systems Design (ISD) model for curriculum development. (ISD is defined in the next section of this chapter, and its application to the conversion process is discussed in detail in Chapter II.)

A strategy for implementing a system to review, evaluate and provide information on military curricula for conversion must also take into account a number of other considerations. On the one hand, several problems have been identified as impeding the use of military curriculum materials by civilian vocational-technical educators. The most pervasive problem in the dissemination and utilization of military materials has been accessibility (Budke 1978). This has been a recurring finding. As Straubel (1971) noted in an earlier study, "(There was) scattered borrowing by schools...but there was no organized transfer of information or techniques." Difficulties in identifying sources of military related curricula, as well as the unavailability of support materials have contributed to the lack of civilian utilization of military instructional curricula (Dozier 1976). And finally, the differences in instructional settings and techniques have contributed to the low incidence of civilian adaptation (Aerospace Education Foundation 1971).

On the other hand, several factors support the adaptation of military materials to civilian vocational and technical education programs (Budke 1978). First, the instructional-systems design procedures used by the military services are rigorous, involving detailed job analyses and formulation of performance objectives. Rigorous evaluation, testing, and necessary revision are integral parts of this process. Second, the curriculum materials are often criterion-referenced. They are intended to train the personnel to perform the necessary tasks in a specific job. Third, the curriculum materials produced are multimedia and include the educational technology for the instructional and learning processes. Fourth, military curriculum materials are constantly being updated to include the latest technological information. And fifth, current revisions of military training programs are emphasizing individualized self-paced instruction.

Four key problems in converting military materials to civilian use have been identified by The Council on Allied Health Evaluation and Accreditation (CAHEA 1978):

1. Common language: Job classification as well as the occupations vary between military and civilian sectors, as well as across military services; this compounds problems in communication and in identifying similar occupations in civilian and military sectors. This lack of consistent terminology is illustrated, by three examples provided in Table I-1 for a health, business and office, and transportation occupation.

2. Comparability of curricula: Training methods, of necessity, vary in military educational programs. To meet its human resources requirements, the military must train personnel as quickly and efficiently as possible, emphasizing attainment of a core level of competency. Although the hours, days and weeks of instruction may be scheduled differently in civilian and military educational programs, the total time spent in instruction and learning may be the same in both military and civilian programs. Therefore, in determining equivalency between military and civilian allied health education, emphasis should be placed on academic and clinical competency rather than on length of training.

Table I-1

Illustration of the Lack of Consistency in Military Terminology: Occupational Titles

Fabrication and Repair of Optical Instruments and Lenses	
1. USOE Cluster:	Health
2. Civilian Title:	Optician, Dispensing 1 (713.361-014)
3. Military Titles:	(Optician's Assistant)
Army:	Optical Laboratory Specialist (42E)
Navy:	Optician Technician (HM-8463)
Air Force:	Optometry Specialist (91255)
Personnel Clerks	
1. USOE Cluster:	Business and Office
2. Civilian Title:	Travel Clerk (238.167-010)
3. Military Titles:	(Clerk)
Army:	Traffic Management Coordinator (71N)
Navy:	Air Transportation Specialist (SK-2821)
Marine Corps:	Passenger Transportation Clerk (3141)
Water Transportation	
1. USOE Cluster:	Transportation
2. Civilian Title:	Stevedore 1 (911.663-014)
3. Military Titles:	(Stevedore)
Army:	Terminal Operations Specialist (57H)
Navy:	Stevedore (BM-0114)
Coast Guard:	Boatswain's Mate (BM)

Source: Department of Defense, 1975, pp. 4-92, 4-170, and 4-228.

3. Accreditation: Some military education programs are accreditated; others, which may qualify, are not. For example, in the allied health areas, representatives of the Army, Navy and Air Force review educational programs accredited by CAHEA (Committees on Allied Health Education and Accreditation) and identify those military programs which most closely resemble the civilian health occupation. In turn, CAHEA does all it can to expedite the review process leading to accreditation for these programs.

4. Registration and certification: Many professionals must be registered and certified to obtain employment in their respective occupations. If the civilian systems are to utilize military training personnel, former military personnel must be able to qualify for the appropriate examinations necessary for registration and certification. For example, in a allied health area, graduation from a CAHEA accredited program is required to qualify for professional examinations.

Purpose of the Study

This study was designed to develop and to provide information that will assist in the selection of national priorities for conversion of Department of Defense products for civilian use in vocational and technical education. It also aims to develop methods and tools to support this activity in subsequent years.

Before the method of this study is described, several key terms should be defined. "Curriculum development" is defined as the process of identifying what is to be learned (the content) and how i is to be presented (the instructional methods). "Conversion" indicates a developer's use of some or all components of curriculum already developed for other than their original purpose(s) or audience(s). Conversion is assumed to be a viable form of curriculum development if it is less time consuming and/or less costly than developing curriculum material anew.

For the purposes of this study, a curriculum development process is conceptualized as an "Instructional System Design" (ISD) model of curriculum development. The ISD process is defined as:

> a systematic procedure for assuring the application of planning and organization to vocational programs. The resulting instructional system is an integrated combination of resources: students, instructors, materials,

equipment; techniques and procedures performing effectively and efficiently the functions required to achieve specified learning objectives. ISD should provide instruction specifically designed to teach students the skills and knowledge required to perform a job (Instructional Materials Laboratory 1972).

"Vocational education," as the term is used in the 1968 Vocational Education Amendments,[1] must meet the following four criteria:

1. type of preparation--skilled or technical training for purposes of attaining entry level, retraining, or upgrading;

2. level of preparation--secondary or post-secondary, excluding professional level training requiring a baccalaureate or higher degree;

3. length of preparation--minimum of two months for upgrading or six months for a new trainee, and any nonprofessional program at less than a four year college level; and

4. probability of placement--favorable competition for jobs in fields related to training of graduates or completers.

---

[1] In Title I, Part A, Section 108, of the 1968 Amendments, vocational education is defined:

> The term "vocational education" means vocational or technical training or retraining which is given in schools or classes (including field or laboratory work and remedial or related academic and technical instruction incident thereto) under public supervision and control or under contract with a State board or local educational agency and is conducted as part of a program designed to prepare individuals for gainful employment as semiskilled or skilled workers or technicians or subprofessionals in recognized occupations and in new and emerging occupations or to prepare individuals for enrollment in advanced technical education programs, but excluding any program to prepare individuals for employment in occupations which the Commissioner determines, and specified by regulation, to be generally considered professional or which requires a baccalaureate or higher degree (U.S. Congress 1968).

In summary, conversion involves building upon a developmental process by beginning with the materials which have been completed and using these materials in the development of new curricula. In this project military curricula will be evaluated in terms of an ISD process; that is, military materials will be characterized in terms of their developmental status--what has been done and what needs to be done to make these curricula appropriate for civilian vocational/technical use.

A description of the methodology implemented to identify, acquire and evaluate candidate military curricula for conversion is presented in the next chapter of this report. Chapter III reports the results of the study, including a description of the evaluative criteria used, a set of individual course evaluations for the twenty candidate courses selected for review and a commercial publisher's critique of the military courses. Chapter IV presents a summary of the findings and the conclusions of the study based on the first year's experience in analyzing military curricula for conversion to civilian use.

CHAPTER II: METHODS

Design of the Study

The task of assembling and presenting information to assist national planners and policy makers in setting priorities for the conversion of Department of Defense curricula for civilian use required that a three-stage research methodology be implemented. The first stage required that vocational education curriculum development needs be determined. The process used to identify national needs for curriculum development was conceptualized in three steps (see Figure II-1).

1. Occupational areas and occupations projected for high employment growth or demand on a national level were identified.[2] (These are represented by Circle A in Figure II-1.)

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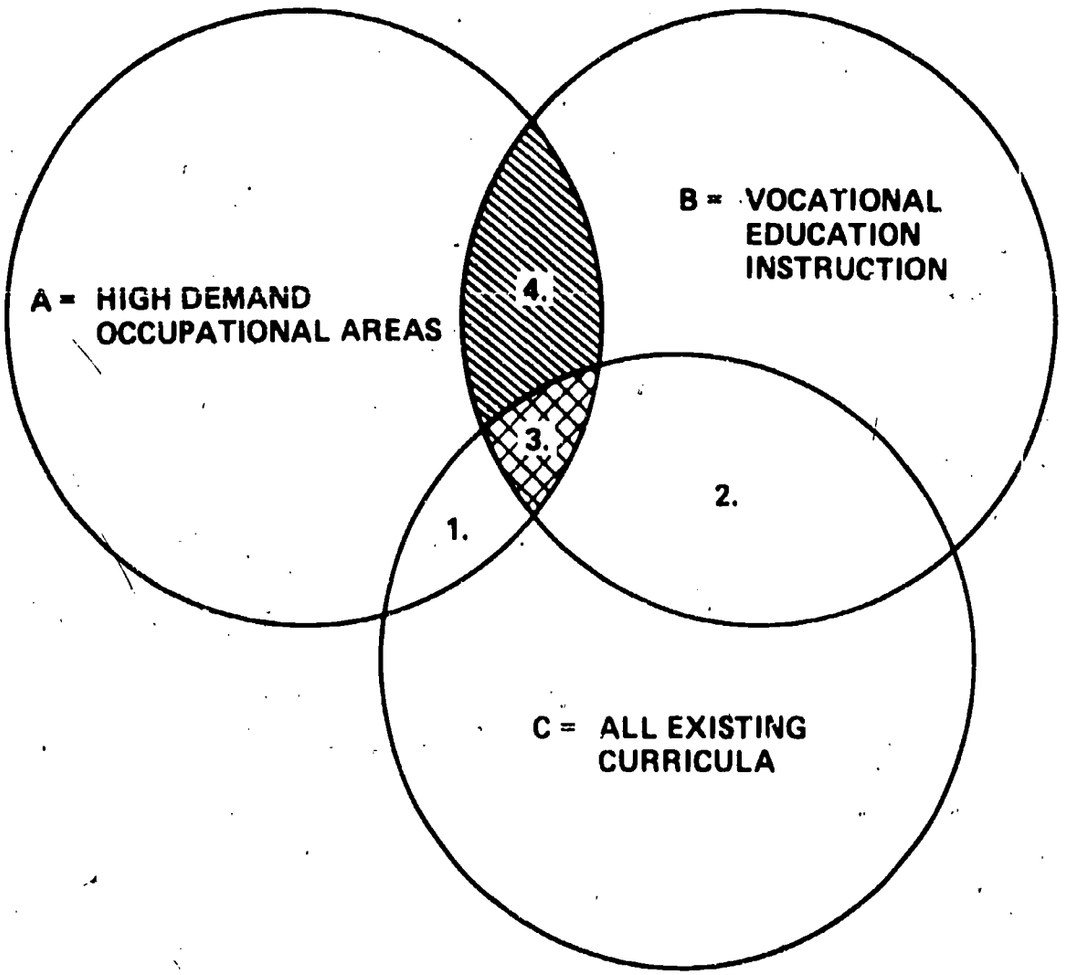
[2] Anticipated annual job openings are determined by two factors: employment growth (new job openings) and the replacement of attrition losses. Employment growth was selected as the critical variable for assessing the viability of future employment opportunities or demand for occupational areas or occupations. Lecht emphasized this point in his recent study on changes in occupational characteristics:

> Slightly more than 900,000 of the job openings anticipated annually between 1970 and 1985 are estimated to arise from employment growth, and the remainder, about 1.8 million, from the replacement of attrition losses. The occupations in which replacement demand dominates job openings tend to have a high representation of women who leave the labor force, at least temporarily, to rear children, and who usually retire at a younger age than men. High replacement demand is also characteristic of slow growth occupations. Employment growth is typically the dominant element in new occupations, in occupations concentrated in rapidly growing industries, often public service industries, and in fields heavily influenced by technological advance. (Emphasis added.) (Lecht 1976, p. 5).

Figure II-1

Identifying Needs for Curriculum Development in Vocational Education for High Demand Occupational Areas



KEY

1. Existing curricula for high demand occupational areas that do not fall within the scope of vocational education instruction, for example, accountants.

2. Existing curricula for established occupational areas that fall within the scope of vocational education instruction, for example, key punch operators.

3. Existing curricula for high demand occupational areas that fall within the scope of vocational education instruction, for example, heating, ventilation and air conditioning workers.

4. High demand occupational areas that fall within the scope of vocational education instruction but for which no adequate curricula exist, for example, safety technician. Existing military curricula for these occupational areas are the primary candidates for conversion.

2. Identified high demand occupational areas or occupations had next to be assessed in terms of whether they fell within the scope of vocational education instruction.[3] (This is represented by Circle B in Figure II-1.)

3. A search of existing curriculum sources in vocational education was conducted to locate curricula that might satisfy the instructional needs of the identified high demand occupational areas and occupations.[4] (Circle C in Figure II-1 represents the population of existing curricula or training programs.)

The outcome of this three-step reduction process, as illustrated by shaded area 4 in Figure II-1, is the identification of curriculum development needs for vocational education.

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[3]See footnote 1, page 6, for definition of vocational education.

[4]The term, occupational area, is used in this report to refer to a larger class of occupations. It is applied much in the same way as the Bureau of Labor Statistics distinguishes between an occupational group level, for example, construction or professional occupations, and a detailed occupational title level, for example, carpenter or accountant. It needs to be recognized that presently there is no standard or commonly accepted terminology for differentiating between these two terms (Carey 1978). The following definitions are provided for four commonly used occupational terms.

Industry. All establishments engaged in producing similar products or providing similar services (Miernyk 1971).

Occupation. An occupation is a group of similar jobs found in several establishments (Shartle 1959).

Job. A job is a group of similar positions in a single plant, business establishment, educational institution, or other organization. There may be one or many persons employed in the same job (Shartle 1959).

Position. A position is a group of tasks performed by one person. There are as many positions as there are workers in the organization (Shartle 1959).

The second stage of the research methodology involved the matching of available military courses and materials with the identified vocational education curriculum development needs. This matching process required the project staff to develop procedures for identifying and acquiring military materials that appeared, based on initial screening of formal schools catalogues of the military services, to be related to vocational education curriculum development needs. (These are represented by shaded area 4 in Figure II-1.)

The third stage of the research procedures entailed an intensive evaluation of the curriculum materials for each selected military course by appropriate subject matter, curriculum development and commercial publisher specialists. Each military course was analyzed to determine areas of strength and weakness in terms of a set of eleven evaluative criteria that were developed based upon the essential requirements of an Instructional System Development (ISD) model for curriculum development. These criteria are defined in Chapter III and their development and selection is discussed later in this chapter.

Research Procedures

The procedures used to determine the findings regarding DOD products for conversion consisted of: (1) identification of priority occupational areas within the scope of vocational education; (2) selection of candidate military courses for review; (3) acquisition of military course materials; and (4) review and evaluation of military course materials.

First Procedure: Identification of Priority Occupational Areas Within the Scope of Vocational Education

This process of identifying curriculum development needs for vocational education was severely hindered both by limited appropriate data about high demand occupational areas, especially for new and changing occupational areas, and a paucity of information on available curriculum. As a result, the demand level became especially important as the primary standard used in identifying and choosing priority occupational areas and occupations. Additional information, such as the availability

of appropriate curricula or training programs,[5] was used by project staff, whenever it was at hand, in making priority determinations. Priority, or high demand, occupational areas were identified based on an analysis of three important sources of nomination: (a) occupations cited in the federal vocational education legislation (Public Law 94-482); (b) high demand, large civilian occupation areas or occupations listed in the Bureau of Labor Statistics' occupational projections for 1985 (Carey 1976; and Bureau of Labor Statistics 1978); and (c) new and changing occupational areas identified by a companion National Center project, titled Information for National Curriculum Development Priorities.[6] A total of ninety-nine candidate occupations were identified from these three sources.

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[5]Information about curriculum development is presently hard to obtain. Several factors contribute to this situation. First, curriculum development in vocational education is a decentralized activity initiated by private and public organizations, for various levels of instruction (secondary, postsecondary, community and technical, and adult), and for various clienteles (regular, special, disadvantaged, and bilingual). Second, no comprehensive clearinghouse on vocational curricula provides centralized access to training programs or to descriptions of all available curricula. And third, there is no common nomenclature to ensure recognition of materials appropriate for a job title, occupation, or program (Forgione and Kopp 1979).

[6]A parallel project being conducted by the National Center involved the identification of curriculum development needs for new and changing occupational areas. New and changing occupational areas are one type of high demand occupational area that meet the following three criteria:

1. high employment growth on a national level[7];

2. emergence over the last decade; and

3. development arising from: (1) the creation of a new industry, occupational area, or occupation; (b) significant restructuring of an existing occupational area or occupation; or (3) modifications in some requirements in an existing occupational area or occupation (Forgione and Kopp 1979).

[7]See footnote 2, page 9, for discussion of the distinction between employment growth and employment demand.

Second Procedure: Selection of Candidate Military Courses for Review

The file of military curricula that was being assembled by another project (Budke 1978) of the National Center was reviewed to identify available military course materials in the priority occupational areas. Next, formal school catalogues of the military services were reviewed to locate additional course materials that could be requested from the Air Force, Army, Marine and Navy sources for the identified occupational areas. Three criteria were then established for screening this large pool of potential materials and for selecting a set of military courses that were related to the identified priority occupational areas or occupations. These included: (a) the occupation had been identified by at least one of the three sources of nomination cited previously; (b) military curriculum has been located either on file at the National Center ("On File" designation in Table II-1), or in the screening of the formal schools catalogues ("On Order" designation in Table II-1); and (c) no obvious problem raised doubt as to the feasibility of conversion.[8]

Table II-1 provides information about occupational areas and occupations for which initial research indicated that military curricula had high potential as candidates for conversion. Of the 99 occupations initially identified as related to civilian needs, only 35 met the criteria noted above.[9] As illustrated in Table II-1 DOD curriculum candidates were identified in seven of the fifteen U.S. Office of Education career clusters. Construction and Health were the two career clusters that seem to offer the greatest potential for conversion by virtue of the availabil-

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[8]These judgments regarding the feasibility of conversion remained uncertain until the actual military curriculum materials could be examined in detail. Problems related to timely acquisition of materials which influenced the selection of courses for review are discussed later in this chapter.

[9]These are also listed in alphabetical order on the Interim Report (see Appendix B-3) which was submitted to the Bureau of Occupational and Adult Education, U.S. Office of Education in the sixth month of the project (July 1978).

TABLE II-1

Occupations for Which Military Curricula Have Been Identified as Initial Candidates for Conversion to Civilian Use

SOURCES of NOMINATION*	CANDIDATE OCCUPATIONS (Listed by U.S. Office of Education-Career Cluster System)	OCCUPATIONAL STATISTICS**		MILITARY MATERIAL AVAILABILITY***	
		Projected Percent Change 1974-1985	Projected Employment in 1985 (in thousands)	On File	On Order
	COMMUNICATIONS AND MEDIA				
N & C:	. none	NA	NA	NA	NA
LEG:	. none	NA	NA	NA	NA
LCO:****	. photographic process workers	43%	110	+	+
	CONSTRUCTION				
N & C:	. nuclear certified pipefitters/welders	NA	NA	+	+
	. retrofitters	NA	NA	+	+
LEG:	. solar energy equipment installers	NA	NA	+	+
LCO:****	. surveyors	59%	116	+	+
	. boilermakers	55%	190	+	+
	. excavating, grading and road machine operators	52%	420	+	+
	. bulldozer operators	51%	190	+	+
	. plumbers and pipefitters	39%	535	+	+
	. electric power line installers	30%	144	+	+
	ENVIRONMENTAL CONTROL				
N & C:	. environmentalists	NA	NA	+	+
	. noise control technologists	NA	NA	-	+
LEG:	. environmentalists	NA	NA	+	+
LCO:****	. none	NA	NA	NA	NA
	HEALTH				
N & C:	. dietetic technicians	NA	NA	+	+
	. medical record technicians	NA	NA	-	+
	. nuclear medical technologists	NA	NA	+	+
	. radiological technologists	NA	NA	+	+
	. respiratory therapy workers	NA	NA	-	+
LEG:	. mental health technicians	NA	NA	+	+
	. physical health technicians	NA	NA	+	+
LCO:****	. other health technologists and technicians	110%	208	+	+
	. nurse aides, orderlies	64%	1506	-	+
	. health aides, except nursing	60%	288	-	+
	. opticians, lens, grinders, polishers	59%	62	-	+
	. clinical lab technologists and technicians	52%	236	+	+
	. dental laboratory technicians	48%	48	+	+
	. radiological technologists	37%	112	+	+
	. dental assistants	31%	155	+	+
	MANUFACTURING				
N & C:	. heat pump installers and servicers	NA	NA	+	+
	. precision sheet metal workers in electronics	NA	NA	-	+
LEG:	. safety technicians	NA	NA	-	+
LCO:****	. air conditioning, heating and refrigeration mechanics	37%	285	+	+
	PERSONAL SERVICES				
N & C:	. dietetic technicians	NA	NA	+	+
LEG:	. none	NA	NA	NA	NA
LCO:****	. cooks, except private household	31%	1250	+	+
	PUBLIC SERVICES				
N & C:	. none	NA	NA	NA	NA
LEG:	. crime prevention and corrections	NA	NA	+	+
	. municipal services	NA	NA	+	+
LCO:****	. garbage collectors	72%	175	-	+
	. police and detectives	46%	665	+	+

* Three sources have been established for identifying the nominated priority occupations for conversion: (a) new and changing occupation priorities developed by the Information for National Curriculum Development Priorities project (N & C); (b) occupations listed in the federal legislation (PL 94-482) (LEG); and (c) large civilian occupations identified by U.S. Bureau of Labor Statistics in their occupational projections for 1985 (LCO).

** For each nominated occupation in the large civilian occupation (LCO) category, we have provided two statistics on projected occupational growth: (a) the projected percent change between 1974 and 1985 for the nominated LCO occupation; and (b) the projected employment in 1985 (in thousands) for the nominated LCO occupation. Source: Max L. Carey, "Revised Occupational Projections to 1985", Monthly Labor Review, November 1976, pp 13-14.

*** Symbols indicate: "+" = available; "-" = not available; and, "NA" = not applicable.

**** To be eligible for consideration under the LCO category, an occupation had to meet three criteria: (a) at least +30% projected change in employment between 1974 and 1985 as reported by BLS; (b) at least 48 thousand persons projected for employment in the occupation in 1985, and (c) applicability to Vocational Education Training.

ity of many military curricula in nominated priority occupational areas or occupations.[10]

Some 150 military courses were identified as relating to the 35 priority occupational areas cited in Table II-1. These military courses are listed in Appendix C, along with their course number, location, and a project identification number.

As illustrated in Table II-2, twenty military courses in three broad occupational areas (allied health, environmental health, and occupational safety and health) were selected for review in the first year. The decision to focus on these three areas, and related courses, was strongly influenced by the findings of the companion National Center project on new and changing occupational areas. The occupational and curricular search and identification activities of the two projects were closely coordinated. Resources provided by this project, such as the Allied Health Education Directory (American Medical Association 1978), and data from the Bureau of Labor Statistics (1978) and Bureau of Health Manpower (1975) were very influential in determining both the occupational areas and the list of twenty candidate military courses selected for review in the first year. Multiple courses were also selected under each occupational area, that is, eleven for allied health, three for environmental health and six for occupational safety and health. This strategy offered a broad base for evaluating both the particular value of an individual course, and the possible opportunities for adopting key components or modules from several courses to fit a civilian curriculum need. Appendix D provides an abstract for each of the twenty candidate courses.

An additional rationale supporting the selection of the allied health area was the availability of key material such as that presented in Table II-3. This framework was extremely valuable in identifying military counterparts to priority civilian occupations, or job titles. This type of detailed breakout was not found for other equally complex occupational areas. The asterisked items in Table II-3 illustrate that the nine military courses shown encompass eight civilian health occupations. More

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[10] Appendix B-4 provides a listing of the Bureau of Labor Statistics occupational projections for 1985 which formed the basis for developing the occupational statistics cited in Table II-1.

Table II-2

List of Candidate Military Courses

for Conversion to Civilian Vocational-Technical Use

Course Title	Source	Course Number	Project Identification Number
Allied Health			
1. Behavioral Science Specialist	Army	302-91G10	45
2. Cardiopulmonary Laboratory Specialist	Air Force	3ALR91630	677
3. Clinical Specialist	Army	300-91C20	39
4. Dialysis Technician	Army	300-F2	42
5. Hospital Food Service Specialist	Army	800-94F20	182
6. Medical Laboratory Procedures (Adv)	Army	311-91B30	53
7. Medical Laboratory Specialist (Basic)	Army	311-92B10	52
8. Operating Room Specialist	Army	301-91D20	43
9. Ophthalmology Surgical Technician	Air Force	5AZY91270	436
10. Optical Laboratory Specialist	Army	311-42E10	50
11. Orthopedic Specialist	Army	304-91H10	49
Environmental Health			
12. Environmental Health Specialist	Air Force	5ABY90730	431
13. Environmental Health Specialist	Army	322-91S10	65
14. Environmental Protection	Air Force	5AZY907X0-1	427
Occupational Safety and Health			
15. Fundamentals of USAF Safety Programs	Air Force	G30Z?8124X	462
16. Hearing Conservation Program	Air Force	5AZY907X0-3	429
17. Industrial Hygiene Measurements	Air Force	5AZY907X0-2	428
18. Industrial Radiological Hazards	Air Force	5AZY907X0-4	430
19. Radiological Safety	Army	7K-F3	305
20. Safety Specialist	Air Force	G3ABR24130	1090

TABLE II-3

Comparison of Civilian and Military Allied Health Occupations

Allied Health Occupation	Military Occupations and/or Service Designation		
	U.S. Army	U.S. Navy	U.S. Air Force
ASSISTANT TO THE PRIMARY CARE PHYSICIAN	Physician's Assistant *Designation:* MOS-911A	Physician's Assistant *Designation:* HM-8442	Physician's Assistant *Designation:* 91770
CYTOTECHNOLOGIST	Cytotechnology Specialist (Medical Laboratory Specialist) (plus Course 311-F3) *Designation:* MOS-92B20U2, MOS-92B30U2, MOS-92B40U2	Cytology Technician *Designation:* HM-8504 Cytotechnologist *Designation:* HM-8505	Cytotechnology Specialist *Designation:* 90432/90472
Dermatology Assistant		Dermatology Technician *Designation:* HM-8495	Allergy/Immunology Specialist/Technician *Designation:* 91234/91274
Electrocardiograph Technician (ECG/EKG Technician)	Cardiac Specialist *Designation:* MOS-91N10		
ELECTROENCEPHALOGRAPHIC TECHNICIAN/TECHNOLOGIST	Electroencephalograph Specialist *Designation:* MOS-91B30T6	Electroencephalography Technician *Designation:* HM-8454	Nuerology Technician *Designation:* 90932/90972
Emergency Medical Service Technician	Medical Specialist *Designation:* MOS-91B10 (plus Emerg. Med. Tech. Course)	Hospital Corpsman – Class A *Designation:* HM-0000 Advanced Hospital Corpsman *Designation:* HM-8425	Medical Services Spec/Tech *Designation:* 90250/90270
	Special Forces Aidman *Designation:* MOS-91F4S	Field Medical Service Technician *Designation:* HM-8404	Aeromedical Spec/Tech *Designation:* 90150
HISTOLOGIC TECHNICIAN	Medical Laboratory Specialist *Designation:* MOS-92B30	Histology Technician, Basic *Designation:* HM-8502 Histology Technician, Advanced *Designation:* HM-8503	Histopathology Specialist *Designation:* 90431/90471
MEDICAL LABORATORY TECHNICIAN (*Certificate*) * #7	Medical Laboratory Specialist (Basic) *Designation:* MOS-92B10	Laboratory Technician (Basic) *Designation:* HM-8501	Medical Laboratory Specialist *Designation:* 90450
Licensed Practical Nurse (LPN) * #3	Clinical Specialist *Designation:* MOS-91C10, MOS-91C40	Hospital Corpsman *Designation:* HM-0000	Medical Service Technician *Designation:* 90270 (Voc. Nurse)
MEDICAL ASSISTANT	Medical Specialist *Designation:* MOS-91B10	Advanced Hospital Corpsman *Designation:* HM-8425	Medical Services Spec/Tech *Designation:* 90250/90270
Medical Illustrator		Medical Illustration Technician *Designation:* HM-8497	Medical Illustrator *Designation:* 23171A
Medical Photographer		Medical Photography Technician *Designation:* HM-8472	Medical Photographer *Designation:* 23270A
MEDICAL LABORATORY TECHNICIAN (*Associate Degree*) * #6	Senior Medical Laboratory Spec *Designation:* MOS-92B30	Medical Laboratory Technician *Designation:* HM-8506	Medical Lab Spec/Tech *Designation:* 90450
MEDICAL RECORD ADMINISTRATOR	Medical Record Specialist *Designation:* MOS-71G40	Medical Service Technician *Designation:* HM-8424	Medical Administration Specialist/Supervisor *Designation:* 90650/90670
MEDICAL RECORD TECHNICIAN	Medical Record Specialist *Designation:* MOS-71G10		
MEDICAL TECHNOLOGIST	Sr. Med. Laboratory Specialist *Designation:* MOS-92B30 Chief Med. Laboratory Specialist *Designation:* MOS-92B40	Medical Technologist *Designation:* NOBC-0850/HM-8507	Medical Laboratory Specialist *Designation:* 90450

TABLE II-3 (continued)

Allied Health Occupation	Military Occupations and/or Service Designation		
	U.S. Army	U.S. Navy	U.S. Air Force
NUCLEAR MEDICINE TECHNOLOGIST		Clinical Nuclear Medicine Tech *Designation:* HM-8416	Nuclear Medicine Technician *Designation:* 90970
Nurse's Aide	Medical Specialist *Designation:* MOS-91B10	Hospital Corpsman *Designation:* HM-0000	Medical Service Specialist *Designation:* 90250
OCCUPATIONAL THERAPIST	Occupational Therapist (Commissioned) *Designation:* MOS-65A	Occupational Therapist (Commissioned) *Designation:* NOBC-0855	Occupational Therapist (Commissioned) *Designation:* 9226
Occupational Therapy Assistant	Occupational Therapy Specialist *Designation:* MOS-91L10	Physical & Occupational Therapy Technician *Designation:* HM-8466	Occupational Therapy Specialist *Designation:* 91351/91331/91231/91251
OPERATING ROOM TECHNICIAN	* #8 Operating Room Specialist *Designation:* MOS-91D10/MOS-91D40	Operating Room Technician *Designation:* HM-8483	Operating Room Specialist *Designation:* 90252
OPHTHALMIC MEDICAL ASSISTANT	Eye Specialist *Designation:* MOS-91Y10	Optical Technician *Designation:* HM-8462	* #9 Ophthalmology Surgical Tech *Designation:* 91270
	* #10 Optical Laboratory Specialist *Designation:* MOS-42E10	Ocular Technician *Designation:* HM-8444	Optometry Specialist *Designation:* 91255/91275/91235/91233
Orthopaedic Physician's Assistant	* #11 Orthopaedic Specialist *Designation:* MOS-91H10	Orthopaedic Cast Room Technician *Designation:* HM-8489	Orthopaedic Clinic Technician *Designation:* 91233/91273
	Brace Specialist *Designation:* MOS-42C10	Orthopaedic Physician's Ass't *Designation:* HM-8463	
Otolaryngology Assistant	ENT Specialist *Designation:* MOS-91U10	Otolaryngology Technician *Designation:* HM-8446	Otorhinolaryngology Surg Tech *Designation:* 91231/91271
Pharmacist's Assistant	Pharmacy Specialist *Designation:* MOS-91Q10	Pharmacy Technician *Designation:* HM-8494	Pharmacy Specialist *Designation:* 90550
		Pharmacist's Ass't *Designation:* HM-8482	Pharmacy Technician *Designation:* 90570
PHYSICAL THERAPIST	Physical Therapist-Commissioned *Designation:* MOS-65B	Physical Therapist-Commissioned *Designation:* NOBC-0873	Physical Therapist (Comm.) *Designation:* 9236
Physical Therapy Ass't	Physical Therapy Specialist *Designation:* MOS-91J10	Physical & Occupational Therapy Technician *Designation:* HM-8466	Physical Therapy Spec/Tech *Designation:* 91350/91370
RADIOLOGIC TECHNOLOGIST	X-ray Specialist *Designation:* MOS-91P10	X-ray Technician *Designation:* HM-8452	Radiologic Specialist *Designation:* 90350
RESPIRATORY THERAPIST			
RESPIRATORY THERAPY TECHNICIAN	Respiratory Specialist *Designation:* MOS-91V10, MOS-91V40	Respiratory Care Technician *Designation:* HM-8541	* #2 Cardiopulmonary Lab Tech *Designation:* 91670
		Cardiopulmonary Technician *Designation:* HM-8408	
SPECIALIST IN BLOOD BANK TECHNOLOGY	Medical Laboratory Specialist (plus Course 311-F1) *Designation:* MOS-92B20M4		Medical Laboratory Specialist *Designation:* 90450
Urologic Physician's Assistant	* #4 (Dialysis Technician Designation: MOS-none)	Urological Technician *Designation:* HM-8466	Urology Surgical Technician *Designation:* 91232/91272

SOURCE: CAHEA, 1978, pp. 12-13.

extensive coverage was provided to the Ophthalmic Medical Assistant through the selection of two courses, Optical Laboratory Specialist and Opthalmology Surgical Technician. In addition, a new occupational specialty was identified and selected, which had not yet been classified in the Council on Allied Health Education and Accreditation (CAHEA) comparison, that is, Dialysis Technician (#4).

Third Procedure: Acquisition of Military Course Materials

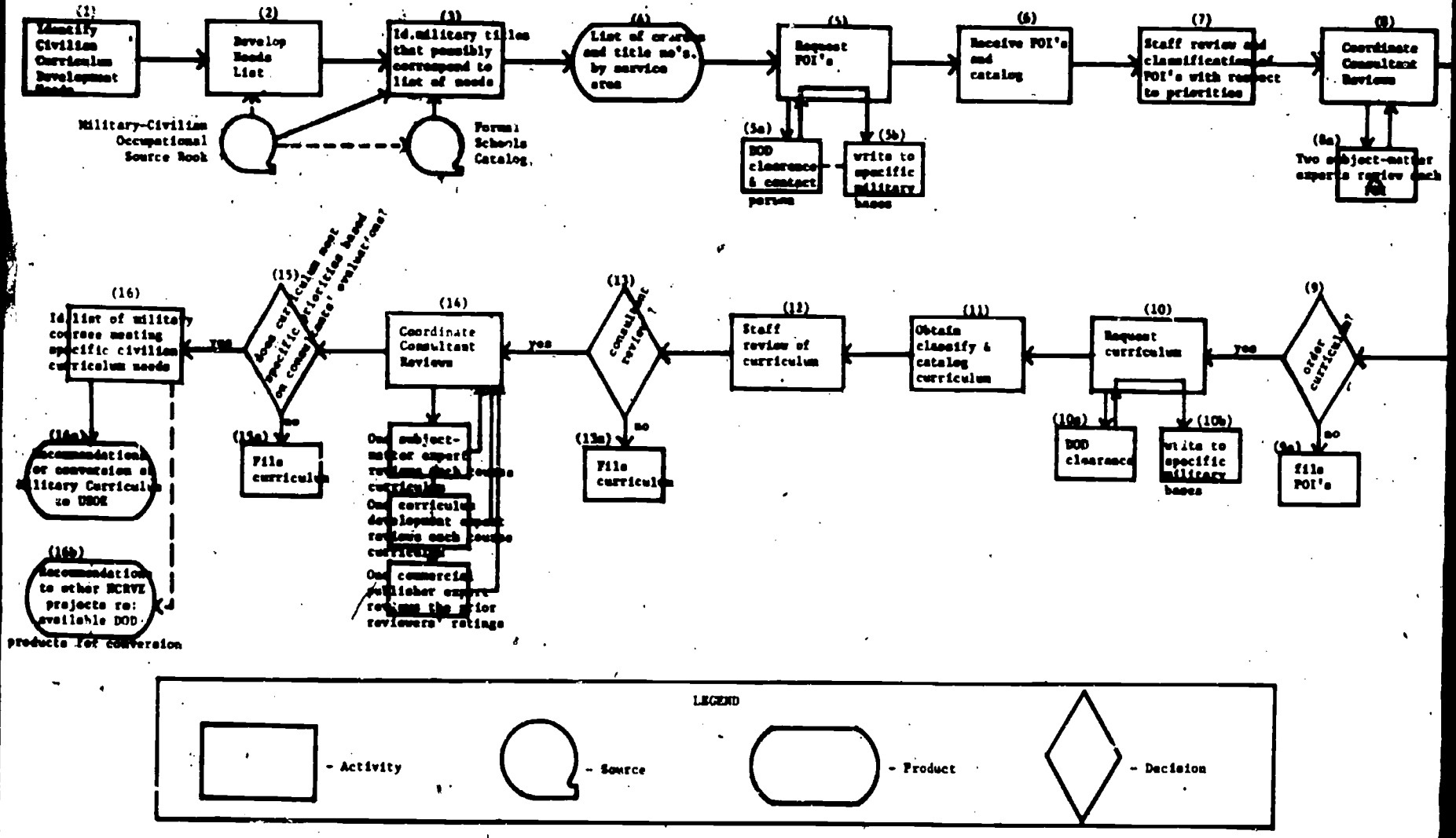
To determine the feasibility of conversion of military curriculum for use in vocational education, military curricula for the identified priority occupations had to be obtained for review. The process utilized to acquire and to evaluate military curriculum materials involved sixteen steps as illustrated in Figure II-2. A Joint Memorandum of Understanding between the U. S. Office of Education (USOE) and the Department of Defense (DOD) outlined the responsibilities of each agency in the acquisition of military materials for the National Center for Research in Vocational Education projects which required them. (See Appendix B-2)

Steps 1 - 4 in Figure II-2 illustrate the procedures that were implemented to identify the list of military courses and titles by service area that correspond to civilian curriculum development needs. Letters were then sent to DOD official contacts as listed in the Joint Memorandum of Understanding requesting access to course materials identified by the project staff (Step 5). The DOD contact then referred the request to the proper military base contact or provided the project staff with the name of a contact from whom to request the military materials. In addition, three key military bases (Lowry Air Force Base, Bethesda Naval Hospital and Fort Sam Houston Army Base) were visited to acquire curricula and to interview instructors and developers regarding factors related to conversion of DOD products to civilian use.

The acquisition of military curricula involved two phases. First, preliminary course materials in the form the Program of Instruction or Plan of Instruction (POI) for the selected military courses were requested from the military base contacts. This phase is illustrated by Steps 5 - 9 in Figure II-2. The POI is a document which spells out the learning objectives of the course and identifies needed support materials and instructional methodology keyed to the objectives (see Appendix B-1, an earlier Joint Memorandum of Understanding). From the information provided in

Figure II-2

Procedure for Identifying, Acquiring and Reviewing Military Curriculum Materials



the POI, the project staff was able to determine if the course could possibly satisfy a curriculum development need for a given occupation. If so, the POI's were then reviewed by two civilian subject matter specialists, usually instructors of a similar course of study in a vocational/technical institution in the state of Ohio to determine if the course curriculum should be acquired and reviewed. (The next section of this chapter, Fourth Procedure: Evaluation of Military Course Materials, provides further information on this process.)

If further review, based on the external reviews, of a military course was indicated, a second phase, the acquisition and review of military curriculum materials for the selected courses, was initiated. This phase is illustrated by Steps 10 - 15 in Figure II-2. The curriculum materials are print and non-print instructional media which include lesson plans, student workbooks, instructional guides, study guides, handouts and programmed texts (see Appendix B-1, an earlier Joint Memorandum of Understanding). Only materials that could be made available without reprinting or reproduction had to be made available by the military services to the project. Final determination of the availability of curriculum materials was made by the military service concerned.

The curriculum received for the priority courses was then reviewed by two external reviewers (Step 14), a subject matter specialist and a curriculum developer. (These procedures are described in more detail in the next section of this chapter, Fourth Procedure: Evaluation of Military Course Materials.) Information on the reviews was then analyzed and synthesized in the form of an individual course evaluation (Step 16). These findings are presented in Chapter III of this report for each of the twenty candidate military courses selected for review.

The project experienced considerable delays in accessing and acquiring military course materials. A great deal of difficulty was encountered in the identification of initial base contacts. It was suggested that in the future, requests for materials, perhaps, be directed to the civilian technical advisor of the training and educational division at the base from which the courses will be requested.

The acquisition of course materials is also a time-consuming process. Appendix E contains a listing of the materials provided for the twenty priority courses. A review of this Appendix clearly illustrates the unevenness of the materials received. In some cases, such as the Medical Laboratory Specialist (Basic), the Medical Laboratory Procedures (Advanced), and the Operating Room Specialists courses, a complete file was provided for each course. However, in other cases, such as Hearing Conservation Program, Industrial Hygiene Measurements and Industrial Radiological Hazards, incomplete files were received. This lack of sufficient materials was a primary cause in the staff's decision to drop some courses from the review process. (These judgments are described in more detail in Chapters III and IV.)

Several field trips to military bases were conducted to review and acquire military course materials. The project staff met with course instructors to explain the project objectives and gather additional information about the courses. The field trips appeared to facilitate the acquisition of course materials; that is, more course materials for each course were received in a shorter period of time. The trips also enabled the project staff to gain a better understanding about course objectives and factors which influence the effectiveness of the course, including instructors, facilities, equipment, and other resources.

Fourth Procedure: Review and Evaluation of Military Course Materials

Rationale for the Development of Military Course Review Guides. The development of guides for the review of military curricula for possible adoption by vocational education evolves from the belief that, although similar, curriculum implementation processes vary according to the needs, conditions, facilities, target audiences, and time frames of the various agencies. A fundamental position assumed by the project is that curriculum modification requires, on the conceptual level, the same components as those used in the original development of the curriculum. However, one advantage of curriculum conversion is that it can build upon identified strengths of existing material instead of starting from "scratch."

Converting military curricula for vocational education programs is not an easy task. Curriculum components and their arrangement need to be assessed in a systematic manner in order to identify the strengths and weaknesses of a given curriculum. The view held here is that such systematic assessment of curriculum materials can be best accomplished with the aid of well-designed review guides. Data accruing from the utilization of curriculum assessment review guides can be used by policy makers in determining if military curricula should be converted for

vocational education use. Given these inputs, two review guides were developed for screening and evaluating military curricula and materials.

The overall objective of the military curriculum review guides was to specify the data to be obtained and to secure the reviewers' judgmental comments regarding the feasibility of converting military courses for use in vocational education.

Data accruing from the implementation of the review guides respond to several "felt needs" of project personnel. These "felt needs" correspond to the types of data required by policy makers considering military curricula for conversion to vocational education. First, there is the very basic need to determine if the military curriculum materials are applicable to civilian occupations and, if so, to how many occupations? Second, there is the need to know if the materials are adequate in the opinion of curriculum experts.

A final need is to identify the strengths and weaknesses of military curricula as aids in making policy decisions. It is necessary to determine which curricula, if any, should be converted for vocational education use. For example, some military curricula were developed using contemporary instructional systems, development models, and task analysis research. But the employment of these strategies may not have been consistent across all services or even across the various occupational areas within one branch of service. It is important to gather information on the recency of curriculum materials developed by the military, especially in the environmental and occupational health and safety areas. Federal legislation can quickly outdate materials in this field.

From a conversion point of view, there is a possibility that several limitations exist in military curricula. Chief among these limitations is the fact that military curricula are inherently inflexible. Military curricula are developed for the training of certain personnel to fill specific job needs; candidates possess certain prerequisites and capabilities; and their training is performed under specific conditions of time, facilities, equipment, and other factors. Thus, from a public sector vocational education perspective, several important factors are not compatible in the way they apply to the content of curriculum for a given occupation. These factors include, but are not limited to: student motivation, mainstreaming, discipline, public support, sex fairness, and advisory committees.

Process of Developing Military Course Review Guides. Components included in the review guides were derived from an analysis of the components of vocational curriculum development as contained in contemporary Instructional Systems Design (ISD) models. The ISD model developed and field-tested by Instructional Materials Laboratory at The Ohio State University (1972) was used in the development of the military curriculum review guides. The Ohio State ISD model includes the three major elements of: (a) occupational research, (b) educational requirements, and (c) organization and instruction. Contained within these major elements are the components of: (a) identification of needs, (b) task list, (c) occupational analysis, (d) course outline, (e) final outline, (f) course of study, (g) objectives, (h) strategies, (i) sequence, (j) grouping/scheduling, (k) related content, (l) lesson plan and instruction, (m) evaluation, and (n) revision. Sections not included in the ISD model but incorporated into the review guides dealt with special needs, considerations and special adaptation considerations such as organizational patterns, equipment, materials, and community resources.

Format and items for the military review guides were prepared to reflect the components of the ISD model. Sample question formats and concommitant response modes for the review guides were gleaned from previously-developed curriculum assessment instruments. These instruments included: (a) the Career Education Materials Assessment Instrument developed by Peat, Marwick, Mitchell and Company (1974), (b) the Instructional Materials Assessment Survey developed by the state of Florida (1977), and (c) the Course Review Summary developed by the Military Curricula Project at the National Center for Research in Vocational Education (Budke 1976), as well as several other instruments used to a lesser degree.

More specifically, the review guide items were generated in a two-day instrument development workshop. Attending were two project staff and an outside consultant with training and experience in vocational curriculum development and evaluation. First, a general format of specific section questions leading into section narrative responses for each major topic was selected. At this time it was decided to develop two different guides in order to respond to the nature of the military curriculum materials

available and the reviewing process itself. A preliminary review guide consisting of seven major parts was to be used for initial screening of the basic instructional materials. For military curricula receiving favorable reviews on this first screening, an enlarged, second military curriculum review guide was developed. This second review guide was similar to the first but included two new sections on: (a) instructional materials, and (b) assessment and evaluation reflecting the desire to obtain and review more instructional materials for this second review. Working section by section, actual review guide items were developed by workshop participants in interactive sessions.

After draft versions of the military review guides were typed, they were submitted to other curriculum development and evaluation specialists for critiquing and suggestions for refinement (see Appendix A, Section 1, Technical Assistance Consultants). The review guides were modified by project personnel based on this second round of development activities. The final version of the Preliminary Military Course Materials Review Guide totaled thirteen 8½ x 14 pages with two top pages eliciting reviewer's background information and providing general instructions. The final version of the Military Curriculum Review totaled twenty-two 8½ x 14 pages with the same top two pages. Reduced facimilies of these two guides are provided in Appendices F and G.

Military Course Materials Review Process. A four-step review process and appropriate procedures were developed to gather judgmental data and narratives for those military curricula designated as candidates. The twenty candidate military courses selected for review were the result of earlier screenings by project staff. The four review steps were:

(1) at least two vocational education subject matter specialists[11] reviewed the adequacy of the preliminary military course materials using the Preliminary Military Course Materials Review Guide (the first guide). Then, if this initial screening was positive,

[11] Whenever it was possible to identify a subject matter specialist at the secondary level for a selected course, a third review was conducted. However, because very few of the twenty selected military courses are presently offered at the secondary level, it was difficult to locate secondary instructors with related subject matter expertise. For only three of the twenty candidates could secondary vocational education instructors be identified within the state of Ohio. Members of the Ohio Department of Education and the Ohio Board of Regents were extremely cooperative and helpful in assisting the project staff in identifying appropriate subject matter specialists. (See Appendix A, Section 2, for a listing of state liaison representatives.)

(2) at least one of the vocational education subject matter specialists then reviewed the adequacy of the military curriculum (expanded materials) using the Military Curriculum Review Guide (the second guide),

(3) a curriculum development specialist also reviewed the adequacy of the military curriculum using the second review guide, and

(4) a commercial publisher/specialist reviewed the ratings of the prior reviewers.

Appendix A contains a list of the 36 subject matter consultants (Section 3), four curriculum development consultants (Section 4), and the one commercial publisher (Section 5) who participated in these review processes. Due to the judgmental nature of the reviews sought for each candidate military course, the project staff decided this four-step review process provided enough opportunities to capture the special analysis skills of the several types of reviewers while, at the same time, this process provided adequate checks and balances on the various types of reviewer biases, based on their particular training or experiential backgrounds.

Use of the two review guides for screening the twenty candidate military courses in the four-step review process led to the development of a course evaluation checklist for each course. As illustrated in Table II-4, the course evaluation checklist consists of eleven factors which evolve from the analyses of completed review guides. Eleven evaluative factors are categorized in three degrees of importance: (a) critical, (b) important, or (c) "nice-to-know".[12] Three possible response values are provided for each of the factors: (a) strong, (b) moderate, and (c) weak. A summary rating of the reviewers' overall evaluation is also provided.

Thus, the ultimate selection of candidate Department of Defense materials for conversion was conducted using a three-phase reduction process: (a) review of formal school catalogues of the four military services; (b) review of selected preliminary military course materials, that is, POIs, topical outlines, etc; and (c) review and evaluation of selected military course curricula. The next two chapters of this report present the results of the individual course reviews (Chapter III) and a summary and conclusions regarding the evaluation of the twenty candidate military courses (Chapter IV).

[12] The symbol ("*") will be used in course Evaluation Charts in Chapter III to denote reviewers' ratings for the five "Critical" factors; the symbol ("+") will be used for the four "Important" factors; and the symbol ("o") will be used for the two "Nice to Have" factors.

Table II-4

Course Evaluation Checklist

Course:

Course Number:

Source:

Length of Course:

Development or Revision Date:

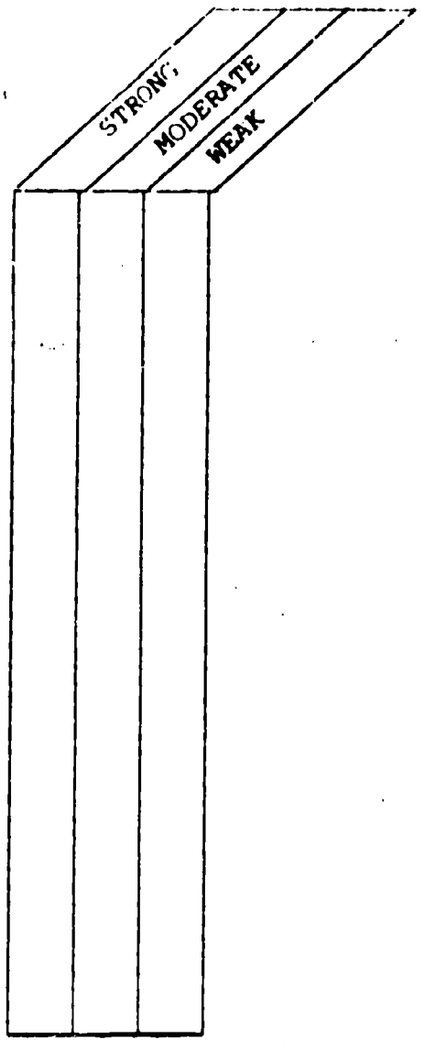
Course Description:

Course Bibliography:

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation

CHAPTER III: RESULTS

This chapter provides three types of information concerning Department of Defense curricula. First, a description of each of the eleven evaluative factors that were developed and used for assessing the feasibility of conversion of candidate military courses is provided. Second, a summary evaluation for each of the 20 candidate military courses is presented, which includes three types of course specific information: basic course information; a graphic presentation of the reviewer evaluations of the military course materials; and a narrative explanation summarizing the judgments of the reviewers. And finally, a critique by a commercial publisher of the military course materials is offered for consideration.

Definitions of Evaluative Factors

Eleven factors, derived from questions on the review guides, were developed as criteria for assessing the quality and utility of military course materials for conversion. For the purposes of this report, these factors are described below. Reviewer ratings are summarized according to one of three categories: strong, moderate, or weak. The definition of a value of strong is provided in the accompanying description for each of the eleven factors.

(1) Curriculum Need

This is an independent evaluation made by the expert reviewers who have unusual knowledge of such matters. This judgment is separate from the determination made earlier in the selection of the military courses to be reviewed, and should provide an independent validation as to whether there are adequate curricula available in the civilian sector for the identified high demand occupational areas or occupations. A value of strong for this factor indicates that there is a need for curriculum and that the conversion of the military curriculum helps to satisfy that need. It should be noted, however, that depending on the types of curricula available and audiences to be served, curriculum in addition to modified military materials may be needed for a given occupation. The term curriculum is defined as print and non-print instructional media to include lesson plans, student workbooks, instructor guides, study guides, handouts, and programmed texts. The military courses being reviewed might satisfy a potential curriculum need because: no curriculum is available (a new occupation); existing materials are not in a readily accessible form and thus not able to be utilized by other civilian instructors in a similar program; or materials are inadequate in terms of form or content for current or future training (a changing occupation).

(2) Course Goals and Objectives

A review of the course goals can provide a determination as to whether or not the military course is congruent with civilian instructional requirements. A value of strong in this factor indicates that the course goals and objectives are present and adequate as written, and either are similar to those currently being taught in vocational education or form a good basis for future vocational education curriculum development. Military outlines usually contain several levels of instructional objectives, from general course goals to very specific objectives stated in the individual lesson plans (see Factor 3 below). For example, the course goal for the Medical Laboratory Specialist (Basic) course is: "To provide graduates of this course with the necessary knowledge and the techniques to perform basic procedures in a medical laboratory." An example of an excellent course objective is: "Given prepared specimens, consistently perform each of four fundamental hematological procedures of the complete blood count with an acceptable degree of accuracy when compared with the established value of each specimen." While course titles can sometimes be misleading when determining the intent or scope of a given course, course goals and objectives once identified in the military course provide a more valid basis for comparison with those established for civilian vocational education programs.

(3) Lesson Objectives

The skills and knowledge required for a given task of the job are identified and described in a three-part lesson (performance) objective: (1) what the person performing the task has to do; (2) under what conditions the task has to be performed; and (3) how well the task has to be performed. A value of strong for this factor indicates that a majority of the lesson objectives contain the three criteria in a desirable form. Lesson objectives are the most specific objectives being considered in this review process. This level of objective is extremely difficult and time-consuming to develop. If the lesson objectives are well-defined and complete, the time required to modify curriculum which fulfills the lesson objectives will be considerably less. The lesson objectives alone, even if no corresponding curriculum is available, can greatly reduce curriculum development time. An example of an excellent lesson objective for the Medical Laboratory Specialist (Basic) course is: "Given the necessary data, calculate the red bloo cell and white blood cell count to the nearest whole number to include the correct unit of report." This lesson objective states all three criteria: what is to be performed; under what conditions it is to be performed; and how well the student has to perform the task.

(4) Technical Accuracy of Instructional Materials

A careful review of the instructional materials is necessary to determine the technical accuracy, including procedures, equipment, pictures, graphs, diagrams, and resources used. A value of strong in this factor indicates the material is technically accurate and up-to-date. With the rapid changes in technology it is possible for instructional materials to become out of date within several years, or in some cases (such as medical occupations) within a matter of months. One of the major advantages of the military curricula is that they are updated more frequently than the public schools can generally manage.

(5) Material Adequacy to Meet Objectives

An objective of the curriculum review is to determine the congruence of the objectives stated in the course outline, which may have received a favorable judgment, with the actual materials designed to teach the skills and knowledge required to perform a given task. A value of strong for this factor indicates that instructional materials are adequate for the stated lesson objectives. The materials also contain, or at least reference, supplemental materials pertinent to the objectives. In curriculum development, generally, once course objectives and performance objectives are established, grouped, and sequenced into specific lessons, the instructional materials are developed. The various levels of objectives, as they relate to specific topic areas and lessons, the method of instruction, and time assigned to the objectives, should be noted in the military course outline.

(6) Instructional and Management Strategies

This factor is concerned with the availability of recommendations to the military instructor concerning possible projects, additional assignments, use of class time, demonstration suggestions, etc., in the military curriculum. A value of strong for this factor indicates that a variety of instructional strategies and management techniques are included in the course materials and are applicable to vocational education. The military material is designed to be used with strict adherence to proven instructional and management strategies. Prior to assignment as instructors, military personnel complete rigorous training and pass review by a "murder board" of trained instructors. Since all military instructors complete the training prior to actual assignment, limited instructional and management strategies are incorporated into the actual curriculum for a given course of instruction. Instructors in the civilian sector will have to develop a variety of strategies to accommodate the needs of students. It is very helpful for civilian instructors to have these creative instructional strategies available to them.

(7) Ease of Adaptation

The identification of characteristics of military course materials that facilitate or limit their adaptation for civilian use is explored in this factor. A value of strong for this factor indicates that: a minimum amount of change is required in the course materials; the time change can be accommodated with little curriculum or scheduling modification; and equipment needs can be satisfied with minimal modification. While any needed subject matter material can be adapted, the question becomes--how easily? For example, the time frame specified in the military curriculum will have to be adjusted in most, if not all, cases since military instruction is based on an eight-hour day of instruction. The equipment needed is also a consideration for adaptation and will vary from course to course. For programs where the equipment expense is prohibitive or supervised work experience is critical to the learning process, community resources may have to be utilized.

(8) Incorporation of Special Needs[13]

Instructional materials can be adapted for use by students with various handicaps. A value of strong for this factor indicates that alternative materials, teaching strategies, and equipment are identified and available as standard or alternative resources for instructing special needs students. It should be noted that while many of the military materials could be used for a variety of students, none was developed to accommodate specific special needs. For example, no braille or large print materials are available from the military sources; the military do not make any special provision in their instructional development for the physically handicapped. Military curriculum developers make certain assumptions about the student population that their civilian counterparts are not able to make. Nonetheless, many materials developed for the majority of students can be used by many students with special needs. The reviewers will look only to identify if special provisions are made in the military curricula for special needs populations.

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[13] Two special population consultants provided assistance to the project staff in defining possible characteristics of curriculum materials that would have special application to the needs of special populations. Appendix H contains two papers: the first (Appendix H-1) discusses the curriculum needs of CETA clients; and the second (Appendix H-2) focusses on special students.

(9) Absence of Copyrighted Materials

An important consideration in curriculum conversion is whether there are copyrighted materials present in the military curricula and whether permission has been obtained for their use. A value of strong for this factor means that the reviewers find little or no referenced copyrighted materials nor materials which appeared to be copyrighted but not noted as such. If the military curricula contain extensive copyrighted materials, then a great deal of time and effort must be spent in either obtaining permission to reproduce the materials in its current state or in rewriting those areas in the materials. The military sources are making concerted effort to eliminate copyrighted materials both from existing curricula and from materials that are currently undergoing revision.

(10) Assessment and Evaluation Criteria

This factor provides information as to the incorporation of assessment activities in the course instruction and the existence of criteria measuring the performance objectives. A value of strong for this factor indicates that the criteria for evaluation of a given course are available for review and are stated in a desirable format. It is assumed for the purposes of these reviews that the assessment instrumentation and evaluation criteria are handled separately by the instructors and that they are not provided with the course materials. This factor is determined to be "nice-to-have" because curriculum modification could be undertaken without evaluation criteria provided the standards for performance are included in the lesson objectives.

(11) Safety and Other Job Attitudes

For the sake of simplicity, job attitudes important to the successful performance of a job are divided into two categories: safety and other job attitudes. A value of strong for this factor indicates that important safety instructions and/or basic job attitudes are included in the material and will require little modification, if any, for use in vocational education programs. With the possible exception of courses which deal specifically with safety, the military includes safety instruction in the specific tasks. A general orientation to safety is usually covered in other military courses or orientation programs and may have to be developed and included prior to utilization of a military course of instruction. A second area of importance is the development attitudes or survival skills. Any materials on job attitude included in a given course are usually specific to the military. Materials dealing with entry level employment skills typically included in vocational educational courses, such as hygiene, grooming, punctuality, peer relationships, will have to be developed prior to a course being implemented in the civilian sector.

Reviewers' Overall Evaluation

In the review guides the reviewers are asked to indicate if they would recommend the course for conversion for use in the civilian sector. The reviewers are also asked to give their overall judgments about the course, including any topics which are not covered in the review guides. A value of strong indicates that a majority of the reviewers feel that the course should be considered for conversion and that in the reviewers' opinion it will be feasible to do so. The reviewers' overall evaluation is not a "factor" of curriculum development, but it provides additional information about the quality of the course as a candidate for conversion.

Summary Evaluations

The information used to develop the 20 summary evaluations for the candidate military courses has been taken from responses to key items and narratives on the review guides completed by both subject matter and curriculum development specialists. For each candidate military course discussed three types of information are provided: certain basic course information; a graphic display of the reviewers' evaluations of the military material; and an explanation summarizing the reviewers' ratings.

Basic Course Information is obtained from the course outline provided by the military service. The information includes the course title and number, the source, the length of training (based on an 8-hour day, 5-day week), and the date the course was developed or revised. This information introduces each course evaluation.

Course Evaluation Charts are provided next. The responses received on the review guides have been presented in terms of eleven evaluative factors. They are grouped into three categories: "critical," "important," and "nice-to-have." Values of strong, moderate, or weak as assigned to each factor indicate the potential for using that curriculum as a base for the development of materials for vocational education.

Explanation of Evaluations is the final category of information provided for each candidate course discussed. The rating for each evaluative factor on the course evaluation chart is explained. This rating was derived from the item responses and narrative sections in the review guides. Particular emphasis was placed on the narrative sections of the review guides.

Of 20 candidate courses initially selected for review in this project, results are presented for the 11 courses that completed the required steps of the review process. These include:

1. Behavioral Science Specialist
2. Cardiopulmonary Laboratory Specialist
3. Clinical Specialist
6. Medical Laboratory Procedures (Adv)
7. Medical Laboratory Specialist (Basic)
8. Operating Room Specialist
12. Environmental Health Specialist (Air Force)
13. Environmental Health Specialist (Army)
14. Environmental Protection
19. Radiological Safety
20. Safety Specialist

Nine of the initial 20 candidate military courses for conversion were dropped from the review process for a variety of reasons. One course was removed from consideration following the preliminary military course materials review stage because subject matter reviewers felt this course was too military specific for utilization in vocational education:

15. Fundamentals of USAF Safety Programs

The eight remaining courses were dropped during the review process because major problems were encountered in acquiring the military course materials necessary for the review process. One course was omitted because no material had been received from the military source:

4. Dialysis Technician

Two courses were not available for review because they are currently under revision by the military services:

5. Hospital Food Service Specialist
10. Optical Laboratory Specialist

The available materials for two other courses were judged to be incomplete based on analysis by project staff, and therefore, these courses were not subjected to curriculum reviews:

9. Ophthalmology Surgical Technician
11. Orthopedic Specialist

Three courses were determined to be lacking in necessary materials by subject matter and curriculum development specialists. Therefor , a valid review was not possible at this time:

16. Hearing Conservation Program
17. Industrial Hygiene Measurements
18. Industrial Radiological Hazards

The eleven courses which completed the review process are described in the following pages.

Course: 1. Behavioral Science Specialist

Course Number: 302-91G10

Source: Army, Fort Sam Houston, Texas

Length of Course: 10 weeks

Development or Revision Date: 10 February 1976

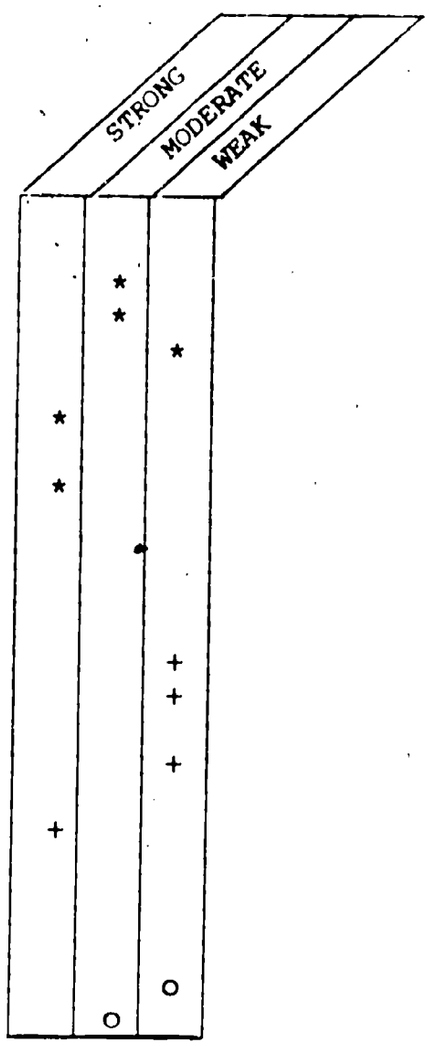
Course Description: See Appendix D, p. 134

Course Bibliography: See Appendix E, p. 160

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation: Strong

Explanation of Evaluations

(1) Curriculum Need

The need for this material is indicated as moderate, since all materials are available in some form in the civilian section. The curriculum is applicable for both post-secondary and in-service programs. The need for complete programs in the field is expected to increase, depending on the legal restraints of the para-professional, such as certification and licensing.

(2) Course Goals and Objectives

The major course goals and objectives are designed around specific military problems and treatments. Some of these would need to be eliminated from the program and others added. Material related to physical and mental disabilities and aging are examples of some areas that would need to be added to the program for use in the civilian sector.

(3) Lesson Objectives

The lesson objectives are incomplete as three-part performance objectives. They specifically define what will be learned, but do not include complete conditions or evaluations. The objectives would have to be expanded, stating conditions and performance levels prior to use in vocational education.

(4) Technical Accuracy of Instructional Materials

The reviewers feel that the material is technically accurate and up-to-date.

(5) Material Adequacy to Meet Objectives

The material does an excellent job in meeting the specifications of the stated objectives which are primarily objectives in the cognitive domain. However, the performance objectives are incomplete, but do indicate what will be learned. The material is rated as adequate.

(6) Instructional and Management Strategies

The instructional strategies utilized are lecture, practical exercise and conference. The most prominent is lecture. There are no classroom management suggestions included in this curriculum.

(7) Ease of Adaptation

The ease of adaptation of this material is rated weak because there is a need for additional background material and complete performance objectives. The time frame also will have to be modified to accommodate the additional material to be included in a complete course of instruction or for utilization as an in-service program. In this program there is no extensive amount of equipment specified, but it would be very beneficial to have the cooperation of a community social service agency to provide required field experience activities.

(8) Incorporation of Special Needs

With the military standards and prerequisites for each program, no consideration is made in this material for the needs of special students. This course is designed for students with basically the same capabilities and background information.

(9) Absence of Copyrighted Materials

There is no evidence that copyrighted material is included in this course of instruction.

(10) Assessment and Evaluation Criteria

The evaluations for the specified objectives are not included in this material. These criteria will have to be developed prior to utilization by vocational education.

(11) Safety and Other Job Attitudes

Other job attitudes, such as ethical standards and values, are covered although the depth required in this subject will depend on the student's background.

Reviewers' Overall Evaluation. Three of the four reviewers comment favorably on this course. There is general agreement that it is suitable for use at the postsecondary level. Comments vary from its being included in a program for para-professional preparation, to its receiving transfer credit towards a college degree. The general feeling is that the subject matter is both applicable and up-to-date, although comments are made regarding the limited time devoted to some aspects of the course.

Course: 2. Cardiopulmonary Laboratory Specialist

Course Number: 3ALR91630

Source: Air Force, Sheppard Air Force Base, Texas

Length of Course: 22 weeks

Development or Revision Date: 27 September 1978

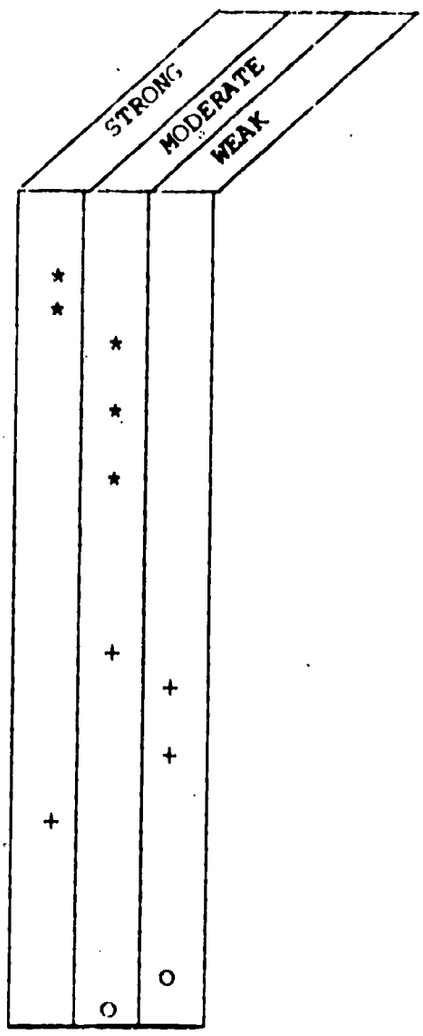
Course Description: See Appendix D, p. 135

Course Bibliography: See Appendix E, p. 163

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation: Strong

2. Cardiopulmonary Laboratory Specialist (continued)

Explanation of Evaluations

(1) Curriculum Need

A high demand for this specific curriculum and trained personnel is indicated. The need for the curriculum will increase in the future as this or related technologies move from large hospital settings into smaller community hospitals. At the present time there is only one program in a four state area according to one subject matter reviewer. Similar components of the program are currently in existence in respiratory therapy. This material could be used as a part of a complete program or for in-service training.

(2) Course Goals and Objectives

Course goals and objectives exist and they are clearly stated. There appears to be a high degree of similarity and applicability to other vocational education programs and to occupations in the civilian sector.

(3) Lesson Objectives

The lesson objectives clearly state two of the required components; what the student has to do and, in limited cases, the conditions under which one activity is to take place. However, the evaluation criteria, as well as the missing conditions, will have to be developed prior to utilization in vocational education instruction.

(4) Technical Accuracy of Instructional Materials

The material is determined to be technically accurate and up-to-date. It is emphasized, however, that the technology in this area is rapidly changing with the development of new equipment.

(5) Material Adequacy to Meet Objectives

The material adequately meets the stated objectives. Extensive background material is required however, if the student does not have prior medical training.

(6) Instructional and Management Strategies

The instructional strategies used in this material are lecture, practical exercise (lab), conference, demonstration, simulation, field observation and supervised work experience. No classroom management strategies are indicated. Management strategies are critical to utilization of this program due to the extensive and costly equipment and instructor staffing requirements.

(7) Ease of Adaptation

The written material could easily be modified for use in vocational education. The time frame will have to be changed depending on the capabilities and backgrounds of students participating in the program. The costly equipment and staffing requirements will severely limit the institutions which could utilize a program of this nature. It is almost imperative that a program in respiratory therapy already be in existence for a school to utilize this course. Extensive community resources in terms of facilities, equipment, and instructors are also required.

(8) Incorporation of Special Needs

No allowances are made in this material for the needs of special students. Additional material, depending on student needs, will have to be developed. The nature of the work and contact with patients limits the type of student who can successfully complete the program.

(9) Absense of Copyrighted Materials

There is no indication of copyrighted material in this course.

(10) Assessment and Evaluation Criteria

Very limited assessment or evaluation criteria are included in this material. Additional criteria will have to be developed prior to utilization in vocational education.

(11) Safety and Other Job Attitudes

Patient safety is discussed in this material. Other job attitudes discussed are military related. More material on safety and other job attitudes will have to be developed depending on the background of the student.

Reviewers' Overall Evaluation. Generally the reviewers feel that there is considerable value in converting this course for civilian use. The degree of modification required, however, will depend on the background of the student. If the student has no prior medical background, courses in anatomy, physiology, patient care techniques and nursing care will have to be added. A need for trained personnel in this field is definitely indicated.

Course: 3. Clinical Specialist (Primary Technical)

Course Number: 300-91C20

Source: Army, Fort Sam Houston, Texas

Length of Course: 16 weeks

Development or Revision Date: 2 June 1977

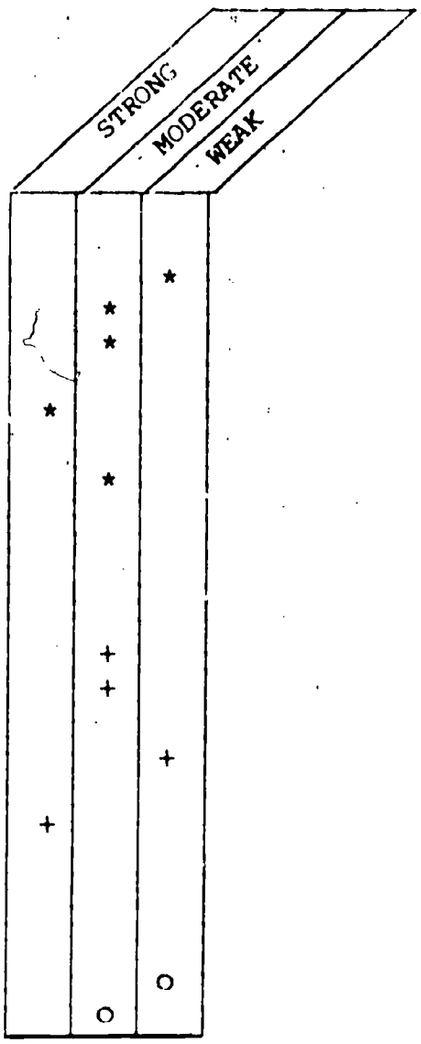
Course Description: See Appendix D, p. 136

Course Bibliography: See Appendix E, p. 165

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation: Moderate

Explanation of Evaluations

(1) Curriculum Need

The reviewers indicate that this program or similar material is presently available. The military clinical specialist seems to fit in between the nurse aide and licensed practical nurse in the civilian sector. A specific use for a program of this nature will have to be defined, perhaps by surveying potential employers, licensing agencies and professional groups.

(2) Course Goals and Objectives

The course goals and objectives stated are relevant to vocational education, although in total do not fit into any specific present program. It seems the clinical specialist is a position unique to the military.

(3) Lesson Objectives

The lesson objectives are consistent in stating what the student will learn and, in most instances, the conditions. The student evaluations will have to be developed, taking into consideration the specific requirements that are desired in the program.

(4) Technical Accuracy of Instructional Materials

The material, including charts and illustrations, is indicated as up-to-date and technically accurate.

(5) Material Adequacy to Meet Objectives

The material meets the needs of the stated objectives. It should be kept in mind that these objectives would have to be adjusted to meet the requirements of any specific program.

(6) Instructional and Management Strategies

The instructional strategies utilized are lecture, practical exercise (lab), demonstration and simulation. These are felt to be adequate methods of presenting this material in a military setting. It is recommended that supervised work experience be used where possible in the civilian sector.

3. Clinical Specialist (Primary Technical) (continued)

(7) Ease of Adaptation

The adaptation of the written material is relatively easy due to its quality and content. Additional background material and student evaluations will have to be developed prior to use in vocational education. The time frame and equipment needs will have to be adjusted to meet specific program needs, once they are identified. Hospitals and clinics in the community could be utilized for field trips, observations and supervised work experience.

(8) Incorporation of Special Needs

The material does not provide for the needs of special students. Additional materials, depending on the need, will have to be developed for use in vocational education.

(9) Absence of Copyrighted Materials

No copyrighted material is present in the curriculum.

(10) Assessment and Evaluation Criteria

The evaluation criteria are omitted and will have to be developed prior to utilization in vocational education. These evaluations will have to be based on acceptable standards in the civilian sector. These may differ from those alluded to in the military program.

(11) Safety and Other Job Attitudes

This program contains limited safety material, but will have to be expanded for use in vocational education. Other job attitudes are discussed, such as: importance of patient's nonverbal communication, comfort of the patient, and legal implications of the job. These will also have to be expanded and placed in perspective for utilization in the civilian sector.

Reviewers' Overall Evaluation. The reviewers feel the material is worthy of conversion, but problems may occur in terms of responsibilities in the civilian sector. It is suggested that hospitals and other potential employers be surveyed to identify the need for such a person prior to conversion of the material.

Course: 6. Medical Laboratory Procedures (Advanced)

Course Number: 311-92B30

Source: Army, Fort Sam Houston, Texas

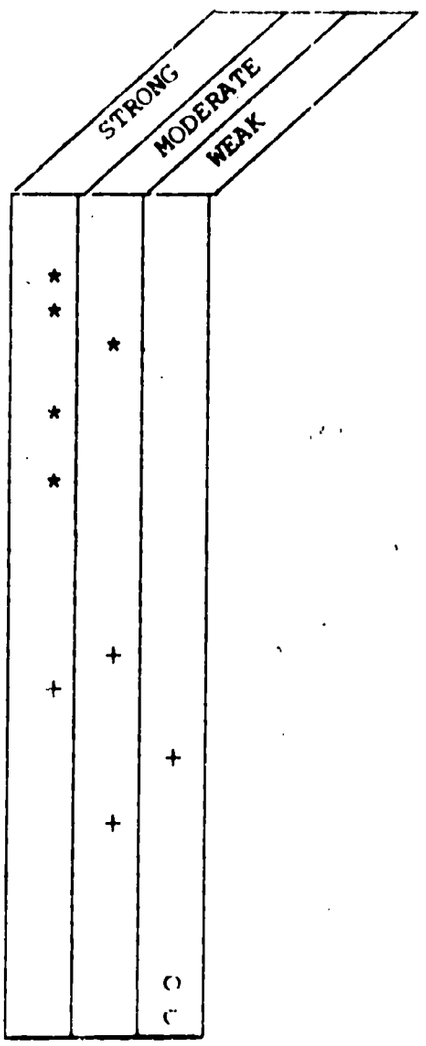
Length of Course: 50 weeks

Development or Revision Date: 2 June 1975

Course Description: See Appendix D, p. 140

Course Bibliography: See Appendix E, p. 169

Course Evaluation Chart



Reviewers' Overall Evaluation: Strong

Explanation of Evaluations

(1) Curriculum Need

The topics presented in the curriculum are available in the civilian sector, but are not grouped together in the same document as in the military curriculum. Reviewers indicate that there is a high need for a curriculum package such as this, particularly if the materials have been approved by the appropriate certification agencies.

(2) Course Goals and Objectives

The course goals and objectives are well stated. However, they are grouped in a consolidated package that is not compatable with existing civilian programs.

(3) Lesson Objectives

The lesson objectives clearly state what the student must be able to do and, in limited cases, state the conditions and performance levels. Since this course of instruction overlaps several levels of laboratory technician in the civilian sector, additional lesson objectives may have to be developed.

(4) Technical Accuracy of Instructional Materials

The material is technically accurate and up-to-date. The reviewers indicate the program is well written, easily read and understood. The diagrams and pictures add greatly to the instructional quality of the material.

(5) Material Adequacy to Meet Objectives

Generally the material does meet the stated objectives of this course of instruction. Some changes will be necessary to comply with specific demands of civilian courses derived from the military curriculum.

(6) Instructional and Management Strategies

The instructional strategies utilized in this program include lecture, practical experience (lab), conference and demonstration. All of these methods of instruction are felt to be appropriate for this program. Other strategies recommended for use in the civilian sector include self-instructional material and supervised work experience. The curriculum does not include any classroom management strategies, which will be a necessity for a complete vocational education program.

(7) Ease of Adaptation

The content of the written material is excellent, but modification will be required depending on the level of medical technician for which the curriculum is utilized. Combined with the Medical Laboratory Specialist (Basic) course reviewers indicate that the curriculum could be used in a two-year program in vocational education. The time frame will have to be modified depending on the course objectives. Community resources, clinics and laboratories can be utilized for supervised work experience.

(8) Incorporation of Special Needs

The curriculum does not provide for the needs of special students. Additional materials, depending on the student need, will have to be developed.

(9) Absence of Copyrighted Materials

Reviewers indicate that some of the material is noted as copyrighted.

(10) Assessment and Evaluation Criteria

The curriculum does not include student evaluations. These evaluations will need to be developed prior to utilization for vocational education. It is recommended that these evaluations be derived from the requirements of the appropriate certification agency.

(11) Safety and Other Job Attitudes

Safety information is incomplete for this program and no other job attitudes are discussed. Both of these areas will have to be extensively developed prior to utilization of the course of instruction in vocational education.

6. Medical Laboratory Procedures (Advanced) (continued)

Reviewers' Overall Evaluation. All of the reviewers feel this course could be of use in vocational education in a modified form. The quality and organization of the material is considered to be excellent.

Course: 7. Medical Laboratory Specialist (Basic)

Course Number: 311-92B10

Source: Army, Fort Sam Houston, Texas

Length of Course: 15 weeks

Development or Revision Date: 8 May 1975

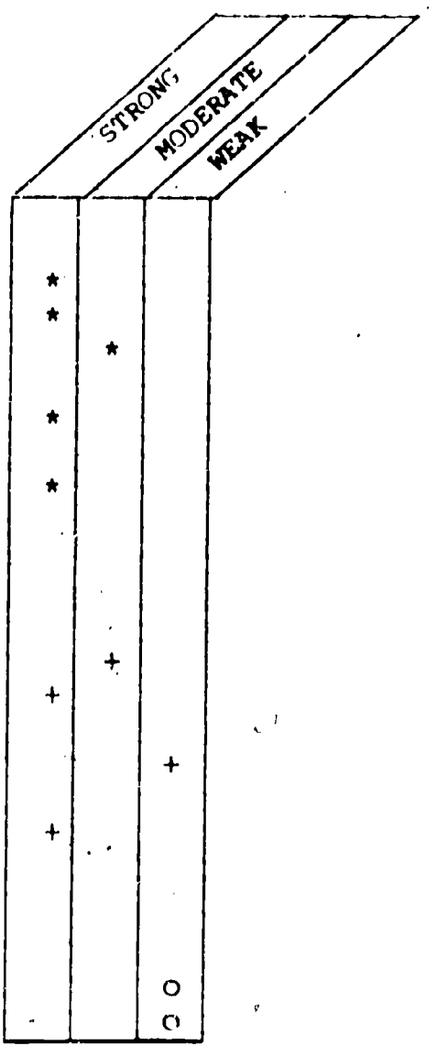
Course Description: See Appendix D, p. 142

Course Bibliography: See Appendix E, p. 179

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need *
(2) Course Goals and Objectives *
(3) Lesson Objectives *
(4) Technical Accuracy of Instructional Materials *
(5) Material Adequacy to Meet Objectives *

Important

(6) Instructional and Management Strategies +
(7) Ease of Adaptation +
(8) Incorporation of Special Needs +
(9) Absence of Copyrighted Materials +

Nice to Have

(10) Assessment and Evaluation Criteria o
(11) Safety and Other Job Attitudes o

Reviewers' Overall Evaluation: Strong

7. Medical Laboratory Specialist (Basic) (continued)

Explanation of Evaluations

(1) Curriculum Need

Although materials of similar content are presently available in the civilian sector, the format and content of the military curriculum is highly desirable. The military medical laboratory specialist performs job responsibilities handled by two different levels of laboratory personnel in the civilian sector, Clinical Laboratory Assistant (CLA) and Medical Laboratory Technician (MLT). Thus, modification of the curriculum would be required. Reviewers express a need for a state or national curriculum that will meet the requirements of the American Society of Clinical Pathologists, Certification of Schools Board. It is suggested that the military curriculum be modified to meet that need.

(2) Course Goals and Objectives

The course goals and objectives are well defined and relevant to vocational education needs, although they seem to overlap two basic medical laboratory areas of study. These will have to be divided to meet specific course needs as the individual programs are developed.

(3) Lesson Objectives

The lesson objectives are incomplete, lacking the student conditions and evaluations. Since this course of instruction overlaps several laboratory programs in the civilian sector, it is difficult to determine to what extent these objectives will correlate with the various course goals. Additional lesson objectives may have to be developed depending on the program.

(4) Technical Accuracy of Instructional Materials

The material is technically accurate and up-to-date. The reviewers indicate the program is well written, easily read and understood. The diagrams and pictures add greatly to the instructional quality of the material. The material is applicable to entry level employment in the civilian sector.

(5) Material Adequacy to Meet Objectives

Generally the material does meet the specifications of the stated objectives of this program. There are some objectives that are emphasized within the military environment which may not be as critical in the civilian sector. Some changes will be necessary in the objectives. Both additions and deletions are needed to comply with specific demands of the courses derived from this broad subject area.

(6) Instructional and Management Strategies

The instructional strategies utilized in this program include lecture, practical experience (lab), conference, demonstration and simulations. All these methods of instruction are felt to be appropriate for this program. Other strategies recommended for possible use in the civilian sector include self-instructional material and supervised work experience. This material does not include any classroom management strategies, which will be a necessity for a complete vocational education course of instruction.

(7) Ease of Adaptation

The content of the written material is excellent, although it is indicated that it is too broad for one program in the civilian sector. This material can be the basis for two programs: Clinical Laboratory Assistant and Medical Laboratory Technician. The time frame necessary for each program will vary greatly depending on the course and certification requirements. It is indicated by the reviewers that the necessary equipment, although costly, is available. The program can utilize community resources, clinics and laboratories, for field observations and supervised work experience.

(8) Incorporation of Special Needs

The material provided does not specifically respond to the needs of special students. However, material can be easily modified to accommodate many special needs students.

(9) Absence of Copyrighted Materials

No copyrighted materials appear to be utilized in this material.

(10) Assessment and Evaluation Criteria

The material does not include student evaluations. These evaluations will need to be developed prior to utilization for vocational education. It is recommended that these evaluations be derived from the requirements of the appropriate certification agency.

(11) Safety and Other Job Attitudes

Safety information is incomplete for this program and no other job attitudes are discussed. Both of these areas will have to be extensively developed prior to utilization of this program for vocational education. Special consideration for professional attitudes, ethics and values will have to be provided for entry level employment skills.

Reviewers' Overall Evaluation. All of the reviewers feel this course could be used in vocational education instruction. The quality and organization of the material is considered to be excellent. The cost of conversion of this course will be reasonably inexpensive, despite the necessary modifications that will need to be made.

Course: 8. Operating Room Specialist

Course Number: 301-91D10

Source: Army, Fort Sam Houston, Texas

Length of Course: 12 weeks

Development or Revision Date: 3 May 1972

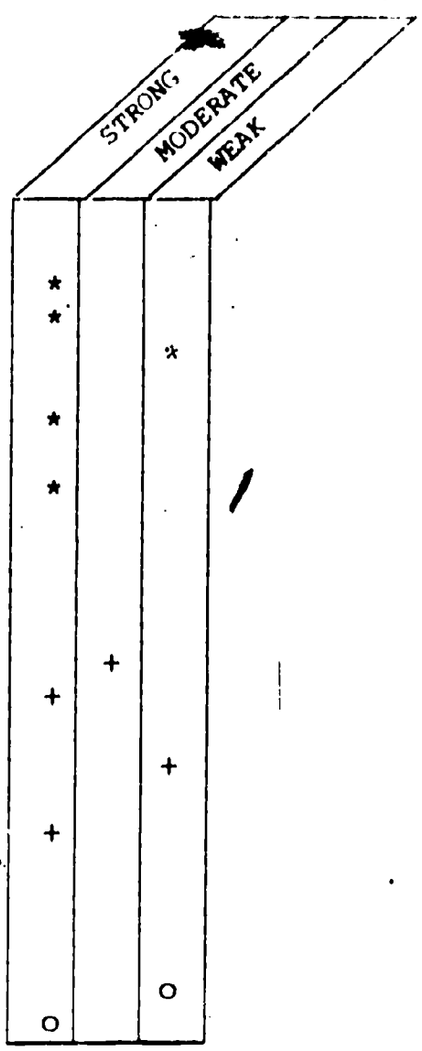
Course Description: See Appendix D, p. 143

Course Bibliography: See Appendix E, p. 186

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need *
(2) Course Goals and Objectives *
(3) Lesson Objectives *
(4) Technical Accuracy of Instructional Materials *
(5) Material Adequacy to Meet Objectives *

Important

(6) Instructional and Management Strategies +
(7) Ease of Adaptation +
(8) Incorporation of Special Needs +
(9) Absence of Copyrighted Materials +

Nice to Have

(10) Assessment and Evaluation Criteria o
(11) Safety and Other Job Attitudes o

Reviewers' Overall Evaluation: Strong

8. Operating Room Specialist (continued)

Explanation of Evaluations

(1) Curriculum Need

The reviewers indicate there is a strong need for this curriculum presently and a steadily growing demand in the future. Due to the specialization in this field, this could be a post-secondary program for operating room technicians or surgical technicians, as well as an extensive in-service program for practicing nurses.

(2) Course Goals and Objectives

The course goals are clearly stated and up-to-date. Since the operating room techniques of the military and the civilian sector are highly correlated, these objectives are relevant to vocational education.

(3) Lesson Objectives

The lesson objectives for this material state what the student will learn and in some instances, include the conditions. Overall, it lacks the needed conditions of performance and student evaluations. These are necessary for use in vocational education and will have to be developed.

(4) Technical Accuracy of Instructional Materials

The instructional materials are technically accurate and up-to-date. Illustrations in the material enhance the clarity of the instructional materials.

(5) Material Adequacy to Meet Objectives

The material is adequate in terms of completeness and technical accuracy to meet the stated objectives.

(6) Instructional and Management Strategies

The instructional strategies used are lecture, practical exercise, conference, demonstration and simulation. It is suggested that additional simulations and supervised work experience be utilized if possible. There are very limited management and alternative teaching suggestions provided, and these would have to be developed.

(7) Ease of Adaptation

The adaptation of the written material will be relatively easy considering the quality of the technical material, but there will be extensive work necessary in revision of the lesson objectives and student evaluations. The time frame will have to be modified to meet the needs of either a postsecondary program or an in-service program. The equipment necessary for this course is available in the public sector and costly. A mock operating room (lab) will be a necessity, as well as cooperation with the local hospitals for field observation or supervised work experience.

(8) Incorporation of Special Needs

The material does not provide for the needs of special students. Additional materials, depending on the need, will have to be developed for use in vocational education.

(9) Absence of Copyrighted Materials

No copyrighted material is present in the curriculum.

(10) Assessment and Evaluation Criteria

There are no student evaluation criteria included in this material. These will have to be developed prior to utilization in vocational education.

(11) Safety and Other Job Attitudes

Safety and other job attitudes are mentioned in this curriculum, although they will need to be more extensive in a vocational education program. Some examples of the attitudes included in this material are safety and comfort of the patient, working as an effective member of the surgical team, and anticipation of the surgeon's needs.

Reviewers' Overall Evaluation. The reviewers feel this curriculum is excellent and could easily be modified for use in vocational education. The use of a mock operating room and other pertinent equipment is strongly recommended, but no other impediments in the utilization of the program are identified.

Course: 12. Environmental Health Specialist

Course Number: 5ABY90730

Source: Air Force, Brooks Air Force Base, Texas

Length of Course: 11 weeks

Development or Revision Date: 19 September 1973

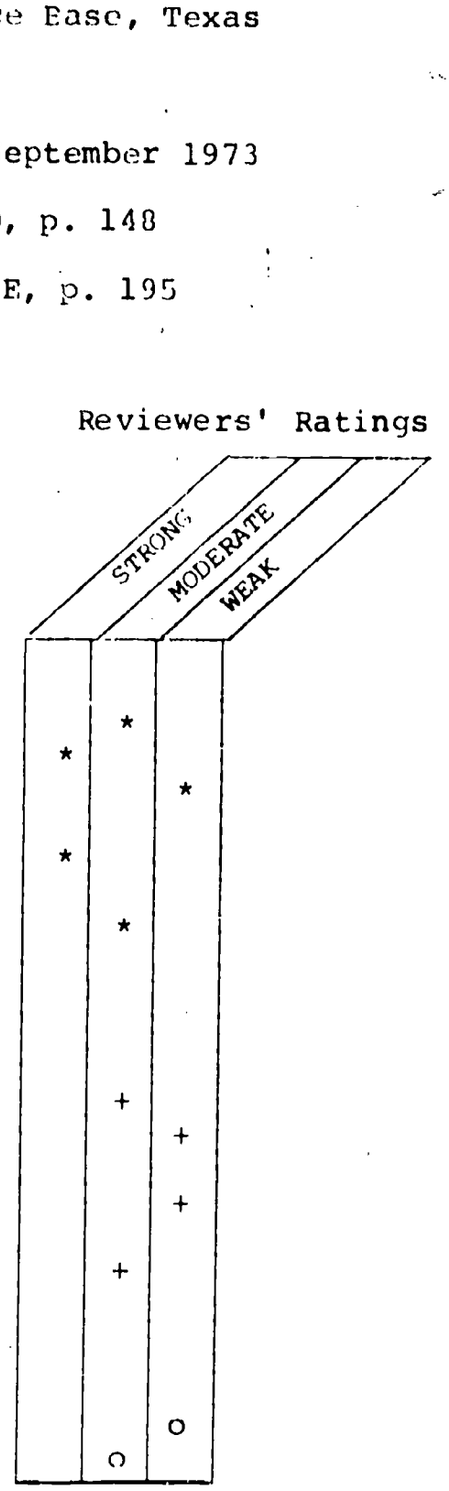
Course Description: See Appendix D, p. 148

Course Bibliography: See Appendix E, p. 195

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation: Moderate

12. Environmental Health Specialist (continued)

Explanation of Evaluations

(1) Curriculum Need

There is presently a moderate demand for curriculum in the area of environmental health (which includes environmental quality control). It is felt the demand for material in this area at the post-secondary level will be increasing in the near future as the demand for environmental health technicians increases.

(2) Course Goals and Objectives

The course objectives is rated as strong, being complete and concise. It is indicated that the course goals do span a large amount of material and the material should possibly be divided into two programs of study.

(3) Lesson Objectives

The lesson objectives are incomplete as three-part performance objectives. They explicitly state what the student will learn but do not include the conditions or evaluation for completion of the objective. Lesson objectives are missing in a majority of the topic areas and these will have to be developed and incorporated into existing material.

(4) Technical Accuracy of Instructional Materials

The content of this curriculum is technically accurate and extensive in scope. Although accurate, the material contains some areas that are applicable to only military interest (i.e., disinfection of water in canteens).

(5) Material Adequacy to Meet Objectives

There is such a vast amount of material for some objectives, it is indicated that many of these objectives and materials could be effectively divided into additional objectives. The material has been rated as moderate due to the amount of time and material that is required for completion of some individual objectives.

(6) Instructional and Management Strategies

The instructional strategies used in this curriculum are lecture, demonstration, practical experience, and field observation. It is suggested that work experience be incorporated into the program. There are no classroom management suggestions or techniques included. These will be very helpful to an instructor and it is suggested that they be developed for the program.

12. Environmental Health Specialist (continued)

(7) Ease of Adaptation

Because of the vast amount of material included in this curriculum, it is recommended that it be divided into two programs. The time frame will have to be altered depending on the amount of background and supplemental material required for a specific course or possibly an in-service training program. Most equipment identified is readily available in the civilian sector. The use of community resources will be valuable in assiting on-the-job training.

(8) Incorporation of Special Needs

No consideration for the special needs of students is incorporated into the material reviewed. Additional material will have to be developed to accommodate the special needs of students.

(9) Absence of Copyrighted Materials

There is some material in this curriculum that appears to be copyrighted but it is not indicated as such. Verification of copyrighted material and appropriate action would be necessary prior to utilization in the civilian sector.

(10) Assessment and Evaluation Criteria

There are no evaluations included in this curriculum. Extensive development of evaluations for all objectives will be required.

(11) Safety and Other Job Attitudes

Safety and other job attitudes are rated as moderate. Additional background information will have to be developed in order to cover all safety aspects of environmental problems. Other job attitudes are discussed in relation to the importance of environmental protection.

Reviewers' Overall Evaluation The general consensus is that the course is too broad in scope for one course. Despite the large amount of materials, there are also some gaps in the topics covered. This course in its current form will have extremely limited use in the civilian sector.

Course: 13. Environmental Health Specialist

Course Number: 322-91S10

Source: Army, Fort Sam Houston, Texas

Length of Course: 15 weeks

Development or Revision Date: 29 August 1975

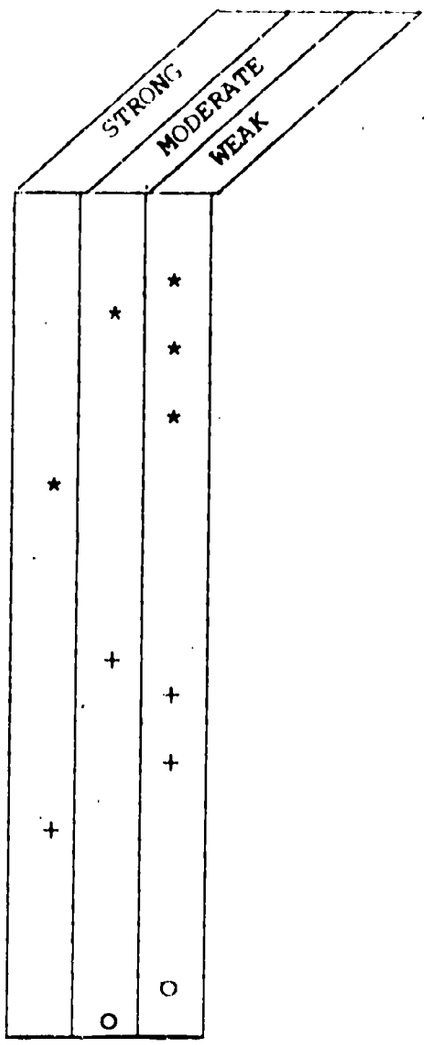
Course Description: See Appendix D, p. 149

Course Bibliography: See Appendix E, p. 199

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation: Weak

Explanation of Evaluations

(1) Curriculum Need

The need for this curriculum is rated as weak by the reviewers. The basis for this judgment is that the material has a very strong connotation of the military environment, much of which does not relate to the civilian sector. There are other materials presently available for this area in the civilian sector.

(2) Course Goals and Objectives

The course goals are included in the curriculum and are well stated, giving an overview of the entire course. It is felt, however, that the goals do not meet the needs of vocational education.

(3) Lesson Objectives

The lesson objectives are written in an inconsistent format, which will be easy to correct, but they are not complete. The objectives indicate to the student what will be learned but do not include conditions and evaluations. Some of the standards of measurement that are included refer to military regulations. It is felt that many of these objectives are different than those required in the civilian sector.

(4) Technical Accuracy of Instructional Material

The reviewers indicate the material is not up-to-date or applicable to vocational education. The material that is present, although not current, is technically accurate in relation to when it was developed.

(5) Adequacy of Material to Meet Objectives

The material included in the curriculum, although not applicable to vocational education, does an excellent job of meeting the demands of the stated objectives.

(6) Instructional and Management Strategies

The instructional strategies used in this material are lecture, demonstration, practical exercise (lab), field observations and self-instruction. These strategies are felt to be effective for military instruction. There are very few classroom management and teacher suggestions included.

13. Environmental Health Specialist (continued)

(7) Ease of Adaptation

The written content of this curriculum could be modified to form a complete course of instruction, if an area of education needing this curriculum could be identified. The reviewers are consistent in stating that this program does not seem to be applicable to vocational education.

(8) Incorporation of Special Needs

With the military's standards and prerequisites for each program, no accommodations are made for the needs of special students. The course is designed for students with basically the same capabilities and background information.

(9) Absence of Copyrighted Materials

It is indicated that there is no copyrighted material included in this curriculum.

(10) Assessment and Evaluation Criteria

The material reviewed does not include any criteria for measuring a student's performance of the objectives.

(11) Safety and Other Job Attitudes

The safety information which is included in this program is restricted to the military environment and does not reflect all safety considerations that will be needed in the public sector. There is no information provided on job attitudes.

Reviewers' Overall Evaluation. Generally, the reviewers do not consider this course suitable for use in vocational education. The comments included such observations as, material is out-of date, too specific to military situations, and not presented in an acceptable way. The consensus is that, even at the postsecondary level, much modification will be required for the materials to have any practical value.

Course: 14. Environmental Protection

Course Number: 5AZY907X0-1

Source: Air Force, Brooks Air Force Base, Texas

Length of Course: 11 days

Development or Revision Date: 16 January 1978

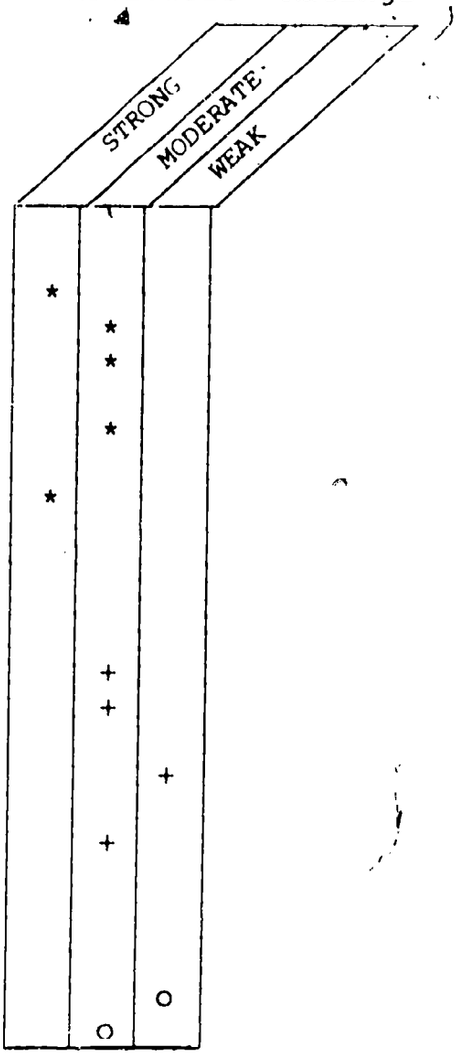
Course Description: See Appendix D, p. 150

Course Bibliography: See Appendix E, p. 202

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation: Moderate

14. Environmental Protection (continued)

Explanation of Evaluations

(1) Curriculum Need

There is a high need for curriculum in this area, with an increasing demand in the future. There are materials in this subject area presently available, but it is felt that technician programs on a postsecondary level need to be developed.

(2) Course Goals and Objectives

Although vague in some aspects, the course goals are rated as moderate. The goals reflect various necessary areas of entry level employment skills as well as areas which could easily be separated for in-service use.

(3) Lesson Objectives

The lesson objectives are incomplete, they indicate what the student will learn but they do not contain an evaluation or condition criteria. In some cases it is felt that the objectives are too broad, covering more material than can be effectively handled by one objective.

(4) Technical Accuracy of Instructional Materials

The materials are considered to be basically, up-to-date and accurate, with the exception of the part dealing with the 1977 Air Pollution Law. This material seems to be, at least in part, derived from the U.S. Environmental Protection Agency training and certification courses, which are also currently available.

(5) Adequacy of Material to Meet Objectives

The material contained in this program gives adequate coverage of the given objectives. The adequacy of the material is based on the opinion that the material has been derived from various available federal Environmental Protection Agency publications.

(6) Instructional and Management Strategies

The instructional strategies used with this material are lecture, demonstration and a limited use of practical exercises. It is recommended that additional student exercises (lab) be developed and supervised work experience be incorporated into the program, if possible. There is a need for suggested class management techniques; none have been included in the material.

14. Environmental Protection (continued)

(7) Ease of Adaptation

The written material, with additions in the areas of performance objectives and evaluations, is very applicable to the civilian sector. The time frame provided, except for the military eight-hour instructional day, seems appropriate for use as a postsecondary technical program. The equipment required is very expensive and it is indicated there is a need for additional equipment and labs which are not noted in the curriculum. Community resources will be a great asset due to the expense of the equipment. It also is suggested that field trips and observations at local companies be incorporated into the program.

(8) Incorporation of Special Needs

No materials or techniques for instruction pertaining to students with special needs are included in this material.

(9) Absence of Copyrighted Material

The reviewers could not identify the material as specifically copyrighted but indicated that it is derived from other publications. Many of these publications may be from federal agencies.

(10) Assessment and Evaluation Criteria

No assessment or evaluation criteria is available for this course. These will have to be developed prior to utilization in vocational education.

(11) Safety and Other Job Attitudes

Safety regulations and requirements are included in the material. A complete program will require additional background information on safety. Job attitudes are discussed from an Air Force point of view and will have to be developed for the civilian sector.

Reviewers' Overall Evaluation. Two of the three reviewers express a favorable response regarding conversion of the material. There is some concern about the apparent lack of practical work experience in the course program. Suggestions are made by the reviewers to integrate the content with business and industry. Considerable comment are made regarding the high need in the civilian sector for trained personnel in this area.

Course: 19. Radiological Safety

Course Number: 7K-F3

Source: Army, Aberdeen Proving Grounds, Maryland

Length of Course: 3 weeks

Development or Revision Date: 26 July 1976

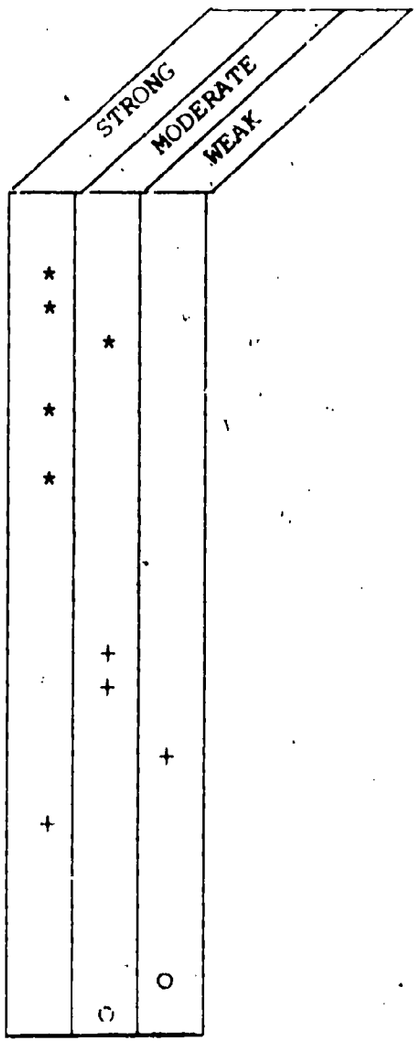
Course Description: See Appendix D, p. 155

Course Bibliography: See Appendix E, p. 208

Course Evaluation Chart

Evaluative Factors

Reviewers' Ratings



Critical

(1) Curriculum Need
(2) Course Goals and Objectives
(3) Lesson Objectives
(4) Technical Accuracy of Instructional Materials
(5) Material Adequacy to Meet Objectives

Important

(6) Instructional and Management Strategies
(7) Ease of Adaptation
(8) Incorporation of Special Needs
(9) Absence of Copyrighted Materials

Nice to Have

(10) Assessment and Evaluation Criteria
(11) Safety and Other Job Attitudes

Reviewers' Overall Evaluation: Strong

Explanation of Evaluations

(1) Curriculum Need

It is indicated that there is presently a moderate to strong need for portions of this program, while the overall demand for this curriculum will increase in the future. It is suggested that this material be combined with other available material to form four or five separate courses. One specific concern identified which relates to curriculum need, however, is the limited employment opportunities for trained workers.

(2) Course Goals and Objectives

The stated course goals are complete, concise, and up-to-date, corresponding to relevant programs in vocational education and actual job responsibilities.

(3) Lesson Objectives

The lesson objectives state what will be learned, the student's performance, and in some areas partial conditions for learning are included.

(4) Technical Accuracy of Instructional Material

The reviewers rate the content of the program as very accurate and current. It is technically precise and consistent with the technical knowledge requirements of a worker.

(5) Adequacy of Material to Meet Objectives

The material does an excellent job of meeting the demands of the objectives. The chapters of the program are so complete and well organized that they could easily be utilized as separate modules of instruction.

(6) Instructional and Management Strategies

The instructional strategies used in this curriculum are lecture, practical exercise, demonstration, self-instruction, and some role playing using case studies. These strategies are determined to be very effective methods for this program. The only additional instructional strategy that is suggested for vocational is supervised work experience. The program does not include any classroom management or teaching suggestions.

(7) Ease of Adaptation

All the instructional materials are very well written and concise. The lesson objectives will have to be expanded to include student conditions and evaluations. The subject matter content of the material is excellent. This curriculum could be supplemented by additional existing materials to comprise four or five separate courses. The time frame will be dependent upon the requirements of specifically developed course, but an adjustment will be necessary. There is a variety of special equipment required, much of which is very costly. Specially equipped labs and community resources, where geographically possible, may be utilized for supervised work experience.

(8) Incorporation of Special Needs

There are no considerations for the special needs of students. The prerequisites for a program of this nature will be very demanding and difficult for special students with severe physical or mental handicaps because this speciality requires both high levels of manual dexterity skills and knowledge of complex subject matter. Considerable development activity will be required to meet the needs of these special students.

(9) Absence of Copyrighted Materials

There is no indication of any use of copyrighted material in this curriculum.

(10) Assessment and Evaluation Criteria

The student lesson evaluations are not included in this curriculum. Assessment and evaluation activities will have to be developed according to civilian sector requirements for use in vocational education.

(11) Safety and Other Job Attitudes

Safety instruction, by the very nature of the course, is included in this material. Additional material may have to be developed and incorporated for use in vocational education, since some safety instruction is probably covered in the prerequisites to this course. Other job attitudes are not discussed, but are a necessary segment of a complete vocational education program and would have to be developed.

Reviewers' Overall Evaluation. All of the reviewers are unanimous in their comments, and are in favor of converting this course for use for vocational education purposes. All expressed the opinion that the material reviewed is excellent in quality, up-to-date, and in their opinion will cost little to convert for vocational use. The only drawback to this curriculum is a limited job market for persons in radiologic safety related occupations.

Course: 20. Safety Specialist

Course Number: G30ZR8124X

Source: Air Force, Lowry Air Force Base, Colorado

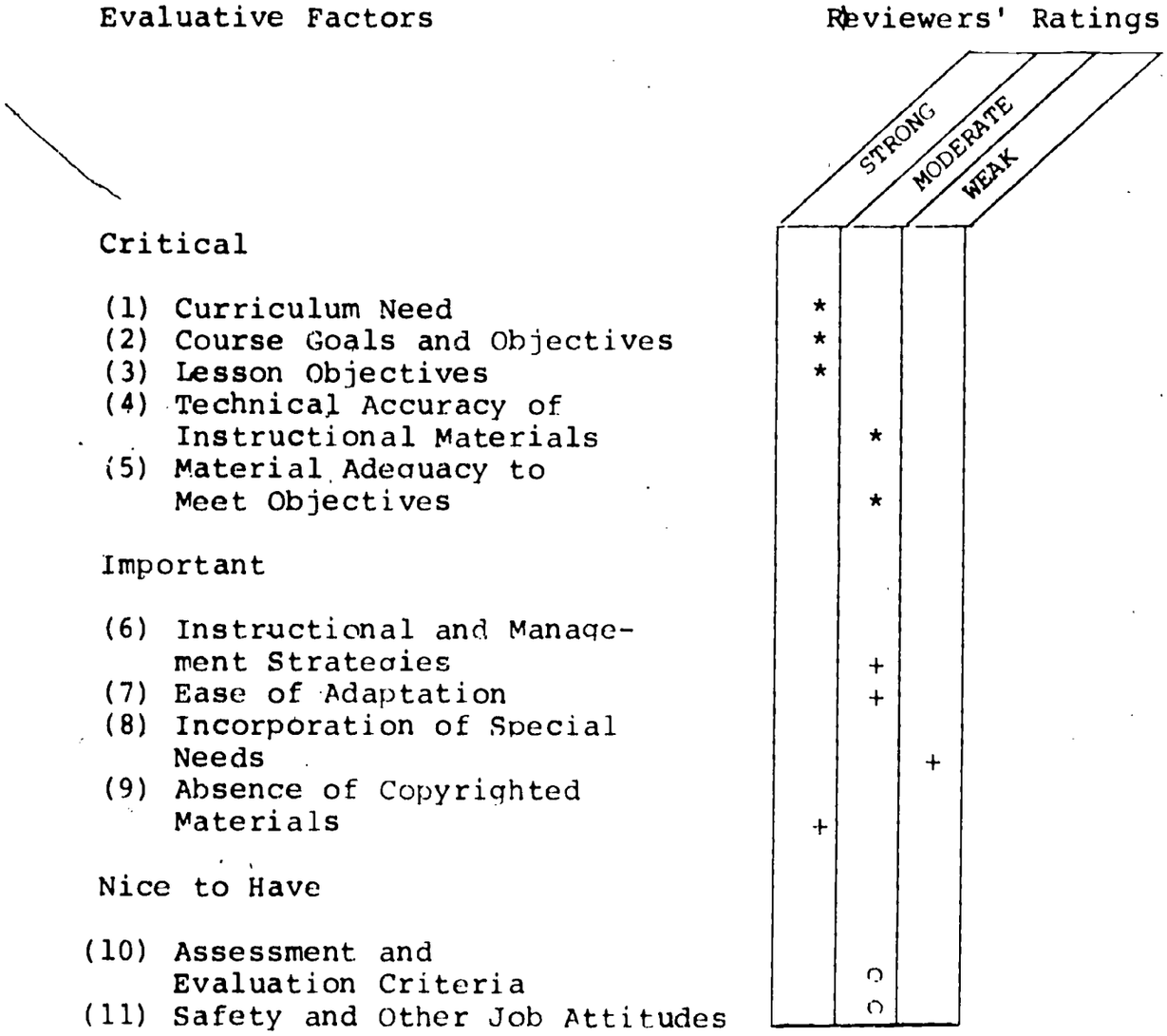
Length of Course: 8 days

Development or Revision Date: 1 July 1976

Course Description: See Appendix D, p. 157

Course Bibliography: See Appendix E, p. 209

Course Evaluation Chart



Reviewers' Overall Evaluation: Moderate

Explanation of Evaluations

(1) Curriculum Need

The reviewers indicate the need for safety curriculum is high and will continue to remain so. A major factor influencing the need by industry in particular, for trained safety personnel, are complex federal and state safety requirements and costly worker's compensation claims.

(2) Course Goals and Objectives

The course goals are well written and complete. With a few exceptions that are specific to the U.S. Air Force, the goals are relevant to vocational education programs.

(3) Lesson Objectives

The lesson objectives are complete performance objectives, which indicate the task to be learned and the conditions and the standard. The objectives also cover required psychomotor, knowledge and attitude learning activities for this course. For these reasons, this factor is rated as strong.

(4) Technical Accuracy of Instructional Materials

The material is indicated to be technically accurate and up-to-date. In some instances (i.e., references to federal regulations) the material may require frequent updating; however, references to specific military situations will have to be replaced with similar materials relevant to the civilian sector.

(5) Material Adequacy to Meet Objectives

The material reviewed does a good job of meeting the stated objectives. Due to the nature of the subject, the material will have to be closely examined as changes in safety regulations occur.

(6) Instructional and Management Strategies

The instructional strategies utilized are lecture, practical exercise, demonstration and simulation. It is recommended that additional simulation and practical exercises (lab) be used if the program is modified for vocational education. Classroom management strategies are not included in this program and these will have to be developed for vocational education.

(7) Ease of Adaptation

Considering the quality of the material, this course could readily be adapted for vocational education. The time frame will have to be adjusted depending on the use of the material. It will be possible to use this material for in-service training or for inclusion in other courses as safety instruction. Equipment needs are minimum; no special equipment is required. Cooperation with industry for field trips and observations is a recommended use of community resources.

(8) Incorporation of Special Needs

The material provided does not provide for the needs of special students. Additional materials, depending on the need, will have to be developed for use in vocational education.

(9) Absence of Copyrighted Material

The reviewers indicate there is no copyrighted material in this program.

(10) Assessment and Evaluation Criteria

Some evaluations in the form of task performance assessments and checklists, which are felt to be very useful, are included in this material. Additional evaluations will have to be developed prior to utilization of this program in vocational education.

(11) Safety and Other Job Attitudes

Due to the nature of the program, safety attitudes are adequately covered. There will have to be additional development of material in terms of other job attitudes.

Reviewers' Overall Evaluation. There is limited agreement regarding the quality and depth of the material. One reviewer feels that the material is fairly military specific and some work will be required to replace military examples with those applicable in the civilian sector, particularly industry. The material is judged to be, at the least, a good basis for curriculum development.

Commercial Publisher's Critique

Additional information regarding the feasibility of conversion is provided for the 11 identified candidate courses in this section. This portion of the review of Department of Defense products will be orgarized around the general procedure that most publishing companies use to decide whether or not to publish materials submitted to them. The review guides prepared by the project staff and the responses of curriculum reviewers were used as a basis for the critique.

Commercial Publisher Procedures for Evaluating Curriculum Materials -- Step One

The first step in the publishing feasibility analysis is very general. The nature and condition of the materials are studied and the market to be served by the proposed materials is identified. In this particular case, the primary purpose of the DOD reviews has been to discover whether or not there is a need for the military products in the civilian market and if so, how easily the materials can be converted for that use. The following questions have been chosen from the military curriculum review guides to represent the items a publisher would use to achieve the first part of the purpose, i.e., determining a need for the military curriculum (critical factor number 1 of the Summary Evaluation).

- Are current materials for this course available in the civilian sector?
- Are current materials for this course adequate in the sector?
- At this point in time, having only reviewed the preliminary military materials, would you recommend this course for conversion for use in vocational education?
- Is material with similar content already available in the civilian sector?
- In your opinion, is there an urgent need for this curriculum in the civilian sector?
- Will the need for course materials in this area expand in the future?

Critical factors from the Summary Evaluation were selected as the basis for determining how easily the materials can be converted. Six of the twelve items (factor numbers 2, 4, 5, 7, 9 and the Reviewers' Overall Evaluation) were identified as representative of a publisher's perspective. The responses by the curriculum reviewers were tabulated accordingly in Table III-1.

It is not possible to rank these according to priority or cost of conversion. On the surface, "Ease of Adaptation" would seem the most costly critical factor. However, if a course were based almost entirely upon one source of copyrighted material, it would probably be very difficult to obtain permission to use it and so that critical factor would be the most costly. Researching to determine the proper technical accuracy can be very time consuming and so that factor might be the most costly.

If an analysis of the responses of the curriculum reviewers to the preceding critical factors indicates that a "no" decision regarding either the lack of market need or the lack of the materials' readiness for the market seems apparent, no further consideration would be made to publish. From the Summary Evaluation, Table III-1, Candidate Courses 3, 12, and 13 seem to be in this category and may not be desirable for conversion either. Candidate Courses 1,2,14 and 20 are somewhat weak for publisher review, but other alternatives for conversion to civilian use may be feasible, such as conversion by educational facilities or perhaps by a commercial publisher on a contract basis without publishing rights.

If a "yes" response is indicated ("Strong" for most of the critical factors such as for Candidate Courses 6,7,8 & 19) then the size of the market and the publisher's projected fair share of that market determine the amount of money the publisher can justify spending to produce proposed materials in commercial form. There are also essential questions regarding copyright--identifying problems with the materials themselves and determining what rights would be granted to a publisher for the commercial products--which must be answered at this first step in the publishing feasibility analysis.

Commercial Publisher Procedure for Evaluating Curriculum Materials -- Step Two

When a positive response is shown for all portions of the preceding step, the second step in the process is to prepare a detailed market study with an intended response from a wide sampling of the market. Input from this detailed study will

Table III-1

Commercial Publisher's Summary Evaluation

Evaluative Factors	Candidate Military Courses					
	1. Behavioral Science Specialist	2. Cardiopulmonary Laboratory Specialist	3. Clinical Specialist	6. Medical Laboratory Procedures (Adv)	7. Medical Laboratory Specialist (Basic)	8. Operating Room Specialist
Critical Factor: Marketing (1) Curriculum Need	Moderate	Strong	Weak	Strong	Strong	Strong
Critical Factors: Curriculum Development (2) Course Goals and Objectives	Moderate	Strong	Moderate	Strong	Strong	Strong
(4) Technical Accuracy of Instructional Materials	Strong	Moderate	Strong	Strong	Strong	Strong
(5) Material Adequacy to Meet Objectives	Strong	Moderate	Moderate	Strong	Strong	Strong
(7) Ease of Adaptation	Strong	Weak	Moderate	Strong	Strong	Strong
(9) Absence of Copyrighted Materials	Strong	Strong	Strong	Moderate	Strong	Strong
Reviewers' Overall Evaluation	Strong	Strong	Moderate	Strong	Moderate	Strong

Table III-1 (continued)

Commercial Publisher's Summary Evaluation

Evaluative Factors	Candidate Military Courses				
	12. Environmental Health Specialist (AF)	13. Environmental Health Specialist (ARMY)	14. Environmental Protection	19. Radiological Safety	20. Safety Specialist
Critical Factor: Marketing					
(1) Curriculum Need	Moderate	Weak	Strong	Strong	Strong
Critical Factors. Curriculum Development					
(2) Course Goals and Objectives	Strong	Moderate	Moderate	Strong	Strong
(4) Technical Accuracy of Instructional Materials	Strong	Weak	Moderate	Strong	Moderate
(5) Material Adequacy to Meet Objectives	Moderate	Strong	Strong	Strong	Moderate
(7) Ease of Adaptation	Weak	Weak	Moderate	Moderate	Moderate
(9) Absence of Copyrighted Materials	Moderate	Strong	Moderate	Strong	Strong
Reviewers' Overall Evaluation	Moderate	Weak	Strong	Strong	Strong

determine what will best fit the needs of students and instructors, thereby naming a program's specifications. From these, a financial analysis is formalized on which the decision to publish a manuscript would be based. To be most effective, the detailed market study should cover the four main interrelated stages of product development.

1. Determining Market Needs--The market study questions for this stage help determine the exact needs of the market and help analyze how well the submitted material correlates to that market.

2. Curriculum Development--The questions for this stage should help in evaluating the proposed material as to publishing readiness. The questions should be aimed at determining the necessary teaching components and such things as scope and direction of student materials. Final analysis of the market study will give guidance to the authors for reworking the material to best fit the needs of the students and instructors of the identified market.

3. Editorial Considerations--Questions for this stage help determine the degree and nature of indicated changes for the proposed materials which normally fall to the editorial staff of the publisher.

4. Production Considerations--Questions for this stage should help determine the nature and degree of work ordinarily completed by the publisher's production personnel. Such work includes design, art rendering, photo procurements, and page layout, as well as audio-visual materials included.

Sample questions follow which show some of the concerns a publisher would need to consider in its detailed market study. These questions are aimed at vital curriculum development considerations which not only determine final specifications of a product but which could indicate very costly changes.

- Which vocational education audiences do you feel can best utilize this course?
- At which level is there the greatest need?
- Which skill level is desired or most appropriate?
- What would be minimum equipment for effective use of material with special groups?

- Which form of staffing is usually available?
- Which method of staffing would be most effective?
- What is usual scheduling and/or organizational pattern(s)? How would material have to be changed to be taught in present structure?
- Can material be used effectively without unusual/expensive equipment? Or, what is minimum equipment necessary for effective use of material?
- Should the materials be packaged for individual use? Or what other use?

In the case where commercial publisher review seems feasible, publisher access to the review guides would be most helpful. Also, many of the comments and suggestions of the reviewers would be valuable in providing pertinent questions to a detailed market study. These opinions could then be verified on a broader basis. Some examples of such comments are as follows:

- A suggestion for ways to break a course into smaller instructional packages; and
- A stated concern that there be more lab and on-the-job activities rather than lectures.

In addition, some suggestions were offered as to who ought to be surveyed to find the proper civilian market for good materials.

CHAPTER IV: GENERAL SUMMARY

Summary of Findings

To provide as much information as possible without merely duplicating the review guides in total, a method of evaluation and presentation of course information had to be created. Eleven factors are identified as necessary elements to be considered in curriculum development regardless of the subject area. The ratings of the factors represent the synthesis of item responses and narrative comments of the reviewers. The factors are grouped into three categories, "critical," "important," ane "nice-to-have." The rating of each factor indicates the potential for using that element of curriculum as a basis for development of materials for vocational education.

Completed Reviews

Eleven of the twenty courses examined completed the review process. The rating assigned to each course on each factor is shown in Table IV-1.

With respect to the five critical factors, three of the eleven courses (Medical Laboratory Procedures (Advanced), Medical Laboratory Specialist (Basic), and Radiological Safety) are very highly rated; that is, they received four strong and one moderate ratings. The moderate rating for each of these three courses is attributed to the fact that one of the three required elements in a lesson objective, usually the performance criteria, is lacking. Course Number 8 (Operating Room Specialist) also is rated highly, but its lesson objectives were judged weak because the descriptions of task performance conditions and required performance levels are considered inadequate.

Three courses (Cardiopulmonary Laboratory Specialist, Environment Protection, and Safety Specialist) are rated strong on curriculum need, and on at least one other critical factor with no weak rating on critical factors. These courses will require more development effort than the highest rated courses. Three additional courses (Behavioral Science Specialist, Clinical Specialist, and Environmental Health Specialist (Air Force)) had slightly lower ratings across the critical areas, but still may have potential for conversion. One course (Environmental Health Specialist Army)) was characterized as generally weak with respect to the five critical factors. Thus, ten of the eleven courses that completed the review process warrant further consideration

Table IV-1

Military Course Evaluation Summary: Complete Reviews

Military Courses	Evaluative Factors: Critical (1) Curriculum Need	(2) Course Goals and Objectives	(3) Lesson Objectives	(4) Technical Accuracy of Instructional Materials	(5) Material Adequacy to Meet Objectives	Important (6) Instructional and Management Strategies	(7) Ease of Adaptation	(8) Incorporation of Special Needs	(9) Absence of Copyrighted Materials	Nice-to-Have (10) Assessment and Evaluation Criteria	(11) Safety and Other Job Attitudes	Reviewers' Overall Evaluation
Allied Health												
1 Behavior Science Specialist	Moderate	Moderate	Weak	Strong	Strong	Weak	Weak	Weak	Strong	Weak	Moderate	Strong
2 Cardiopulmonary Laboratory Specialist	Strong	Strong	Moderate	Moderate	Moderate	Moderate	Weak	Weak	Strong	Weak	Moderate	Strong
3 Clinical Specialist	Weak	Moderate	Moderate	Strong	Moderate	Moderate	Moderate	Weak	Strong	Weak	Moderate	Moderate
6 Medical Laboratory Procedures (Adv)	Strong	Strong	Moderate	Strong	Strong	Moderate	Strong	Weak	Moderate	Weak	Weak	Strong
7 Medical Laboratory Specialist (Basic)	Strong	Strong	Moderate	Strong	Strong	Moderate	Strong	Weak	Strong	Weak	Weak	Strong
8 Operating Room Specialist	Strong	Strong	Weak	Strong	Strong	Moderate	Strong	Weak	Strong	Weak	Strong	Strong
Environmental Health												
12 Environmental Health Specialist (AF)	Moderate	Strong	Weak	Strong	Moderate	Moderate	Weak	Weak	Moderate	Weak	Moderate	Moderate
13 Environmental Health Specialist (Army)	Weak	Moderate	Weak	Weak	Strong	Moderate	Weak	Weak	Strong	Weak	Moderate	Weak
14 Environmental Protection	Strong	Moderate	Moderate	Moderate	Strong	Moderate	Moderate	Weak	Moderate	Weak	Moderate	Moderate
Occupational Safety and Health												
19 Radiological Safety	Strong	Strong	Moderate	Strong	Strong	Moderate	Moderate	Weak	Strong	Weak	Moderate	Strong
20 Safety Specialist	Strong	Strong	Strong	Moderate	Moderate	Moderate	Moderate	Weak	Strong	Moderate	Moderate	Moderate

in terms of conversion for vocational education. This judgment is reinforced by the reviewers' overall evaluations.

The ratings for the four important factors varied within each course, but are remarkably consistent across the eleven courses. No course received a majority of strong or moderate ratings for these important factors.

The ratings for the nice-to-have factors are generally moderate or weak.

Incomplete Reviews

Nine of the twenty courses did not complete the review process. Because of the limited amount of materials available to the project on these courses, a valid review and subsequent rating of each of the eleven factors was not possible. The reviewers were able to make three judgments based only on a review of the course outline: curriculum need, course goals and objectives, and overall evaluation. These judgments are summarized in Table IV-2 which provides the following information for each course which did not complete the review process: evaluative judgments; the reason the review was not completed; and an indication of future action to be taken. As indicated in Table IV-2, only one of the twenty candidate courses was dropped from the review process due to the high military-specific content.

Conclusions of the Study

An analysis of the ratings presented in Table IV-1 for the individual factors indicates that the following conclusions can be made about the general characteristics of military curricula.

- Military curricula are available to meet curriculum needs as indicated by the high ratings of the subject matter experts for the courses selected for review.
- Military curriculum development procedures generally do produce materials that have well-stated course goals and objectives and that meet the stated objectives of that curriculum, as indicated by the ratings for factors 2 and 5. However, additional curriculum development attention is needed with respect to lesson objectives (factor 3).
- Reviewers indicate that the military courses examined do demonstrate a high degree of technical accuracy of the instructional materials (factor 4).
- Materials usually include a variety of relevant instructional strategies, but often lack classroom management strategies (factor 6).

Table IV-2

Military Course Evaluation Summary: Incomplete Reviews

Military Course	Preliminary Military Course Materials Review	Reasons for Not Responding	Future Action
Allied Health 4. Dialysis Technician	.Strong curriculum need .Strong relevant objectives .Strong overall evaluation	Material on order but not received	Follow-up acquisition and re-evaluation in the second year
5. Hospital Food Service Specialist	.Moderate curriculum need .Moderate relevant objectives .Moderate overall evaluation	Material currently being revised by military	Acquire revised materials and re-evaluate in the second year
9. Ophthalmology Surgical Technician	.Strong curriculum need .Moderate relevant objectives .Moderate overall evaluation	Inadequate materials received for review based on staff assessment	Acquisition of additional materials and re-evaluation in the second year.
10. Optical Laboratory Specialist	.Strong curriculum need .Moderate relevant objectives .Strong overall evaluation	Material currently being revised by military	Acquire revised materials and re-evaluate in the second year
11. Orthopedic Specialist	.Moderate curriculum need .Moderate relevant objectives .Moderate overall evaluation	Inadequate materials received for review based on staff assessment	Acquisition of additional materials and re-evaluation in the second year
Occupational Safety and Health 15. Fundamentals of USAF Safety Programs	.Moderate curriculum need .Weak non-relevant objectives .Weak overall evaluation	Material highly military-specific based on reviewer's assessment	No further action
16. Hearing Conservation Program	.Strong curriculum need .Strong relevant objectives .Strong overall evaluation	Inadequate material received for review based on reviewer's assessment	Acquisition of additional materials and re-evaluation in the second year
17. Industrial Hygiene Measurements	.Strong curriculum need .Strong relevant objectives .Strong overall evaluation	Inadequate material received for review based on reviewers' assessment	Acquisition of additional materials and re-evaluation in the second year
18. Industrial Radiological Hazards	.Strong curriculum need .Strong relevant objectives .Strong overall evaluation	Inadequate material received for review based on reviewers' assessment	Acquisition of additional materials and re-evaluation in the second year

- The consistantly weak ratings for factor 8 indicate that none of the military curricula reviewed were developed to accommodate specific needs of special students. Nonetheless, many military materials developed for the majority of students can be adapted for use by many students with special needs.

- Reviewers indicate for factor 9 that little or no copyrighted materials are incorporated in a majority of the instructional materials. This seems to reflect the military's efforts to eliminate copyrighted materials from their courses of study.

- Evaluation criteria and testing materials generally are not included in military instructional materials. Tests and assessment procedures do exist at training sites, as project staff found during the visits to three selected sites. However, these materials are not available for review at this time.

- Many of the job attitudes discussed in the curriculum are military-specific. Job attitude materials will have to be developed for civilian related situations.

Plans for Next Year

It is planned that the study of Department of Defense products will continue in year two of the National Center contract. The initial year's activity required the development of prototype methods for (a) identifying priority occupational areas, primarily new and changing occupations, related to vocational education curriculum development needs; (b) establishing communication linkages with existing information sources on available vocational education curriculum; (c) acquiring, organizing, and analyzing military curriculum materials.

Having completed this early development work and having constructed efficient research procedures, the process of evaluating military curricula will proceed more efficiently in the future; that is, more attention will be concentrated on analysis and less on the mechanics of acquisition. In addition, in planning the second year it will be possible to spend less effort in liaison and acquisition activities since the National Center's Clearinghouse will be undertaking a more active and aggressive acquisition program with respect to civilian and military curriculum materials.

In the second year, project staff will continue to monitor and to identify occupational areas of concern to vocational education that offer high employment growth, that is, new and changing occupations, and to locate military courses that are possibly appropriate for these opportunities. The some 150 military courses that were identified as initial candidates (see Appendix C) will be re-verified and additional priorities will be considered next year. Special attention will also be given to special population needs, particularly training appropriate for CETA (Comprehensive Employment and Training Act) programs; instruction for limited ability students, such as exceptional children; and employment for non-traditional occupations.[14] The two-stage screening process implemented in year one, that is, the preliminary military course materials review and the military curriculum review, will again be used to assess the appropriateness of the military materials for conversion to vocational education use.

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[14]Two special population consultants provided assistance to the project staff in defining possible characteristics of curriculum materials that would have special application to the needs of special populations. Appendix H contains two papers: the first (Appendix H-1) discusses the curriculum needs of CETA clients; and the second (Appendix H-2) focusses on special students.

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APPENDIX A

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APPENDIX B

PROJECT RELATED DOCUMENTS

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APPENDIX B-1

Joint Memorandum of Understanding

SUBJECT: DOD Curriculum Materials Utilization in Vocational Education

1. This memorandum outlines the responsibilities of the U.S. Office of Education (USOE) and the Department of Defense (DOD) or their legal representatives in achieving the objectives of the Education Amendments of 1976, 20 USC 2401, Sec. 171(b) (3). In recognition of the above statutory provisions, USOE has awarded a contract for the implementation of a SYSTEM to identify, acquire, evaluate and disseminate curriculum materials developed by the DOD for use in the nation's civilian educational programs. Dissemination of DOD curriculum materials will occur through USOE/contractor linkage with existing national, state and local diffusion networks. It is the desire of DOD to collaborate with USOE in this program to facilitate the use of DOD developed curriculum materials by civilian educators and thereby promote the instructional benefits that will be derived by the nation's civilian educational systems. This agreement covers the first five (5) years of system operation. Matters which are not covered by this memorandum will be mutually resolved by the primary parties within budgetary constraints.

2. Definitions

a. Curriculum Materials: Print and non-print instructional media to include lesson plans, student workbooks, instructor guides, study guides, handouts and programmed texts. (See paragraph 3a (2) below)

b. Available DOD Curriculum Materials: Curriculum materials that can be made available without reprinting or reproduction. Does not include copyright or classified material. Final determination of the availability of curriculum materials will be made by the Military Service concerned.

c. Program of Instruction or Plan of Instruction (POI): A document which spells out the learning objectives of the course and identifies needed support materials and instructional methodology keyed to the objectives.

d. Department of Defense (DOD): Includes the active elements of the Military Services (Army, Navy, Marine Corps, and Air Force).

3. Responsibilities

a. Pursuant to attaining the objectives of the Education Amendments of 1976, USOE or its legal representative (contractor) will:

(1) Use the American Council on Education's "Guide to the Evaluation of Educational Experiences in the Armed Services" insofar as possible as a source for identifying and selecting potential courses for review.

(2) Prior to submitting a request to the Military Services, attempt to obtain available curriculum materials from existing information and retrieval systems such as ERIC clearinghouse, the American Council on Education, and other Federal Agencies or institutions. Commercially prepared audiovisuals will be referred to the developer; military films will be obtained through the National Audiovisual Center.

(3) After identifying course materials that are not available from existing information and retrieval systems, forward a request for the materials by military course name (or specific course topics) to the appropriate Service representative as shown in paragraph 3b(4) with a copy to the Office of the Deputy Assistant Secretary of Defense for Program Management, DASD(PM), Pentagon, Washington, D.C. 20301.

(4) Review at the training site those curriculum materials determined by the appropriate Service as not available, i.e., one of a kind materials or those which cannot be made available without reproduction or reprinting.

(a) The USOE or its representative will arrange for reproduction, packaging and shipment of all materials selected at the training site.

(b) The USOE or its representative will reimburse the appropriate Service for requested course materials which must be reproduced or printed to satisfy the requirements of the curriculum materials utilization project. The decision to reproduce requested material for the purpose of supporting the project, will be made by Service personnel and will be accomplished consistent with available time and resource limitations.

(5) Return to the appropriate Military Service, on termination or completion of the contract or of directly related follow-up undertakings, all curriculum material other than that for which the Service has been reimbursed. Curriculum materials, if required for the DOD mission, will be returned to DOD on call.

Provide the Deputy Assistant Secretary of Defense, Program Management (DASD(PM)) with updates of applied research and development activities prepared by the National Center for Research in Vocational Education. Technical reports, interpretive papers, interim products, etc., will also be made available to DOD in order to assure full dissemination of Center products and use by the Military Services. The DOD representative will arrange for reproduction of requested research and development reports that are not available in sufficient quantity (i.e., 7 copies) to satisfy the DOD request.

b. The Department of Defense or its Service representatives will:

(1) Make determinations regarding availability of requested curriculum materials.

(2) Provide on request, available curriculum materials for specified courses, pursuant to 2a and 3a(2), when not available through other existing information and retrieval systems.

(3) Assist on a reimbursable basis and as requested, consistent with available time and resources, in the reproduction of course materials. (See paragraphs 3a(4)(a), (b)).

(4) Provide a point of contact within each Military Department to serve as Service representative. The Service representatives are:

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APPENDIX B-1 (continued)

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APPENDIX B-2

Joint Memorandum of Understanding

Subject: DOD Curriculum Materials Utilization in Vocational Education

1. This memorandum updates a previous Joint Memorandum of Understanding and outlines the responsibilities of the U. S. Office of Education (USOE) and the Department of Defense (DOD) or their legal representatives in accomplishing the objectives of USOE RFP 77-34. The subject RFP was issued by USOE in anticipation of awarding a contract for the implementation of a small scale system identifying, acquiring, evaluating and disseminating curriculum materials developed by the DOD for utilization by the Nation's civilian educational programs through linkage with existing national, state and local systems. It is the desire of the DOD to cooperate in programs which will facilitate such utilization of curriculum materials developed by the DOD. The USOE and DOD recognize the value of the instructional and cost benefits to be derived by the Nation from civilian institutional adoption/adaptation of DOD instructional materials and techniques. Matters which arise during the conduct of the proposed contract that are not covered by this memorandum will be mutuallly resolved by the primary parties within budgetary constraints.

2. Definitions.

   a. Available Curriculum Materials. Those print and non-print materials that can be made available for the duration of the contract without reprinting or reproduction. Final determination of the availability of curriculum materials will be made by the Military Department concerned.

   b. Program of Instruction or Plan of Instruction (POI). For the purpose of this agreement, a document(s) which spells out the learning objectives of the course and identifies needed support materials and instructional methodology keyed to the objectives.

   c. Department of Defense (DOD). Includes the active elements of the Military Departments of Army, Navy, Marine Corps, and Air Force.

3. Responsibilities.

a. Pursuant to attaining the objectives of RFP 77-34, USOE or its legal representative (contractor) will:

(1) Use the American Council on Education's "Guide to the Evaluation of Educational Experiences in the Armed Services" insofar as possible as a source for identifying and selecting potential courses for review.

(2) Within the terms of the contract, prior to submitting a request to DOD, attempt to obtain available curriculum materials from existing information and retrieval systems such as ERIC Clearinghouses, American Council on Education, National Audiovisual Center, and other Federal Agencies or institutions.

(3) After identifying those course materials that are not available from existing information and retrieval systems, forward a request for the materials by course name (or specific course topics) to the appropriate Service representative as shown in paragraph b.(4) below with a copy to the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) OASD(M&RA).

(4) Review and select, at the training site, those curriculum materials determined by the appropriate Service as not available i.e., one of a kind materials or those which cannot be made available without reproduction or reprinting.

(a) The USOE or its representative will arrange for reproduction and packaging for shipment of all material selected at the training site. Requests to visit training sites will be coordinated with the appropriate Service representative prior to travel.

(b) The USOE or its representative will reimburse the appropriate Service for requested course materials which must be reproduced or printed solely to satisfy the requirements of the curriculum materials utilization project. The decision to reproduce requested material that

is not otherwise available, for the sole purpose of supporting the project, will be made by Service personnel and will be accomplished consistent with available time and resources.

(5) Return to the appropriate Military Department, on termination or completion of the contract or of directly related follow-up undertakings, all curriculum material provided by the Military Department, other than that for which the Departments have been reimbursed. Curriculum materials, if required for the DOD mission, will be returned to DOD on call.

b. The Department of Defense or its Service representatives will:

(1) Make determinations regarding availability of requested curriculum materials.

(2) Provide on request, available curriculum materials for specified courses, pursuant to 3A(2), when not available, within the terms of the contract, through other existing information and retrieval systems.

(3) Assist on a reimbursable basis and as requested, consistent with available time and resources, in the reproduction of course materials that are not available. (See paragraph 3a(4), (b)).

(4) Provide a point of contact within each Military Department to serve as Service representative. The initial Service representatives are as follows:

Army	LCol Robert E. Lanzotti DCS Personnel (DAPE-MPT) Room 2A712, Pentagon Washington, DC 20330
Navy	Mr. Dale Thurman CNO (OP 991 C1) Room 1220 BCT-1 Washington, DC 20350
Marine Corps	LCol J. M. Kennan Commandant of the Marine Corps Education Services Branch HQ USMC (Code OTTE) Washington, DC 20380

Air Force	Col H. H. Hagenbrock Chief, Education Division Director of Personnel Program Hdqts. USAF Room 4C240 Washington, DC 20330

For matters concerning the project as a whole, contact:

USOE	Miss Mary V. Marks, Chief Dr. Ned Logan Curriculum Development Branch, BOAE Room 5036, ROB #3 Washington, DC 20202
DOD	LCol L. G. Junkman OASD (M&RA) Room 3B930 The Pentagon Washington, DC 20230

Department of Defense	Office of Education
I. M. Greenberg Deputy Assistant Secretary for Defense for Planning and Requirements DASD (P&R)	Ann M. Martin Acting Deputy Commissioner for Occupational and Adult Education

APPENDIX B-3

Interim Report

Department of Defense
Products for Conversion

Pascal D. Forgione, Jr.
and
Mollie N. Orth

The National Center for Research in Vocational Education
The Ohio State University
June 1978

Department of Defense Products for Conversion

This Interim Report presents a summary of preliminary information about Department of Defense curricula which are candidates for conversion to civilian use. Specific occupational areas for which the conversion of DOD products would fill pressing civilian training needs are being identified by analysis of three sources: (a) occupations listed in the federal vocational education legislation (PL 94-482); (b) new and changing occupation priorities developed by the Information for National Curriculum Development Priorities project; and (c) large civilian occupations identified by the U. S. Bureau of Labor Statistics' occupational projections for 1985. A total of 99 candidate occupations have been identified from these three sources.

DOD curricula responsive to these civilian needs are being identified and evaluated for conversion by a three-phase reduction process: (a) review of formal school catalogues of the five military services; (b) review of selected specific course outlines; and (c) review and evaluation of promising military course curricula.

Six kinds of information are being used to judge the feasibility of converting military curriculum:

- Curriculum content: (a) job analysis; (b) measurements of performance; (c) training approach; (d) training setting; (e) quality control of training; and (f) evidence of effectiveness
- Copyright restrictions
- Size and diversity of learner groups: (a) numbers; and (b) educational levels
- Probable user acceptance, adoption or utilization
- Time required for conversion
- Costs of conversion

To date, the file of military curricula available at the National Center has been reviewed, formal school catalogues have been reviewed, and course outlines have been requested from the Army, Navy and Air Force for new and additional promising courses.

Preliminary Findings

Table 1 provides information about occupations for which initial research indicates that DOD curricula have high potential as candidates for conversion. Of the 99 occupations so far identified as civilian needs, only 35 met all three criteria for the initial screening for materials conversion: the occupation has been identified by at least one of the three sources of nomination described previously; military curriculum has been located either on file at the National Center ("On File" designation in Table 1), or in our screening of the formal schools catalogues ("On Order" designation in Table 1); and no obvious problems raised doubt as to the feasibility of conversion. It should be noted, however, that these judgments of feasibility remain uncertain

until the curriculum materials can be examined in detail.

DOD curriculum candidates have been identified in seven of the fifteen U. S. Office of Education Career Clusters. Construction and Health are the two career clusters that seem to offer the greatest potential for conversion by virtue of the availability of many military curricula in nominated priority occupations.

Military curriculum has been requested for the following candidate occupations (listed in alphabetical order):

- air conditioning, heating and refrigeration mechanics
- boilermakers
- bulldozer operators
- clinical laboratory technologists and technicians
- cooks, except private household
- crime prevention and corrections
- dental assistants
- dental laboratory technicians
- dietetic technicians (twice listed Table 1)
- electric power line installers
- environmentalists (twice listed Table 1)
- excavating, grading and road machine operators
- garbage collectors
- health aides, except nursing
- heat pump installers and servicers
- medical record technicians
- mental health technicians
- municipal services
- noise control technologists
- nuclear certified pipefitters/welders
- nuclear medical technologists
- nurse aides, orderlies
- opticians, lens grinders, polishers
- other health technologists and technicians
- photographic process workers
- physical health technicians
- plumbers and pipefitters
- police and detectives
- precision sheet metal workers in electronics
- radiological technologists (twice listed Table 1)
- respiratory therapy workers
- retrofitters
- safety technicians
- solar energy equipment installers
- surveyors

Because critical analyses and assessments of the identified DOD curricula will be conducted over the next six months of the project, these preliminary findings may be altered in our final report.

APPENDIX B-3 (continued)

Table 1: Occupations for Which Military Curricula Have Been Identified as Initial Candidates for Conversion to Civilian Use

SOURCES of NOMINATION*	CANDIDATE OCCUPATIONS (Listed by U.S. Office of Education-Career Cluster System)	OCCUPATIONAL STATISTICS**		MILITARY MATERIAL AVAILABILITY***	
		Projected Percent Change 1974-1985	Projected Employment in 1985 (in thousands)	On File.	On Order
	COMMUNICATIONS AND MEDIA				
N & C:	. none	NA	NA	NA	NA
LBG:	. none	NA	NA	NA	NA
LCO:****	. photographic process workers	43%	110	+	+
	CONSTRUCTION				
N & C:	. nuclear certified pipefitters/ welders	NA	NA	+	+
	. retrofitters	NA	NA	+	+
LBG:	. solar energy equipment installers	NA	NA	+	+
LCO:****	. surveyors	59%	116	+	+
	. boilermakers	55%	190	+	+
	. excavation, grading and road machine operators	52%	420	+	+
	. bulldozer operators	51%	190	+	+
	. plumbers and pipefitters	39%	535	+	+
	. electric power line installers	30%	144	+	+
	ENVIRONMENTAL CONTROL				
N & C:	. environmentalists	NA	NA	+	+
	. noise control technologists	NA	NA	-	+
LBG:	. environmentalists	NA	NA	+	+
LCO:****	. none	NA	NA	NA	NA
	HEALTH				
N & C:	. dietetic technicians	NA	NA	+	+
	. medical record technicians	NA	NA	-	+
	. nuclear medical technologists	NA	NA	+	+
	. radiological technologists	NA	NA	+	+
	. respiratory therapy workers	NA	NA	-	+
LBG:	. mental health technicians	NA	NA	+	+
	. physical health technicians	NA	NA	+	+
LCO:****	. other health technologists and technicians	110%	208	+	+
	. nurse aides, orderlies	64%	1506	-	+
	. health aides, except nursing	60%	288	-	+
	. opticians, lens, grinders, polishers	59%	62	-	+
	. clinical lab technologists and technicians	52%	236	+	+
	. dental laboratory technicians	48%	48	+	+
	. radiological technologists	37%	112	+	+
	. dental assistants	31%	155	+	+
	MANUFACTURING				
N & C:	. heat pump installers and servicers	NA	NA	+	+
	. precision sheet metal workers in electronics	NA	NA	-	+
LBG:	. safety technicians	NA	NA	-	+
LCO:****	. air conditioning, heating and refrigeration mechanics	37%	285	+	+
	PERSONAL SERVICES				
N & C:	. dietetic technicians	NA	NA	+	+
LBG:	. none	NA	NA	NA	NA
LCO:****	. cooks, except private household	31%	1250	+	+
	PUBLIC SERVICES				
N & C:	. none	NA	NA	NA	NA
LBG:	. crime prevention and corrections	NA	NA	+	+
	. municipal services	NA	NA	+	+
LCO:****	. garbage collectors	72%	175	-	+
	. police and detectives	46%	665	+	+

* Three sources have been established for identifying the nominated priority occupations for conversion: (a) new and changing occupation priorities developed by the information for National Curriculum Development Priorities project (N & C); (b) occupations listed in the federal legislation (Pl. 94-482) (LBG); and (c) large civilian occupations identified by U.S. Bureau of Labor Statistics in their occupational projections for 1985 (LCO).

** For each nominated occupation in the large civilian occupation (LCO) category, we have provided two statistics on projected occupational growth: (a) the projected percent change between 1974 and 1985 for the nominated LCO occupation; and (b) the projected employment in 1985 (in thousands) for the nominated LCO occupation. Source: Max L. Carey, "Revised Occupational Projections to 1985", Monthly Labor Review, November 1976, pp 13-14.

*** Symbols indicate: "+" = available; "-" = not available; and, "NA" = not applicable.

**** To be eligible for consideration under the LCO category, an occupation had to meet three criteria: (a) at least +30% projected change in employment between 1974 and 1985 as reported by BLS; (b) at least 48 thousand persons projected for employment in the occupation in 1985, and (c) applicability to Vocational Education Training.

APPENDIX B-4

Bureau of Labor Statistics
Occupational Projections to 1985

APPENDIX B-4 (continued)

Table 1

Large Civilian Occupations: Percent Growth

Priority Ranking for Individual Occupations

The following is a list of the top 65 occupations ranked according to their projected percent change in employment between 1974 and 1985. *

Rank	Occupation	Projected Percent Change 1974-1985	Projected Employment In 1985 (# in Thousands)
1	Dental hygenists	158%	58
2	Other health technologists & technicians	110%	208
3	Practical nurses	97%	965
4	Teacher aides, except school monitors	88%	507
5	Data processing machine repairer	86%	93
6	Other clerical workers, N.E.C.	85%	2,478
7	Other technicians, except health, engineering & science	80%	113
8	Welfare service aides	73%	95
9	Garbage collectors	72%	175
10	Asbestos & insulation workers	67%	50
11	Computer systems analysts	65%	160
12	Nurses aides, orderlies	64%	1,506
13	Health aides, except nursing	60%	288
14a	Opticans, lens grinders, polishers	59%	62
14b	School monitors	59%	55
14c	Surveyors	59%	116
17	Child care workers, except private households	56%	627
18	Boilermakers	55%	62
19a	Clinical lab technologists and technicians	52%	236
19b	Excavating, grading & road machine operators	52%	420
21	Bulldozer operators	51%	190
22	Secretaries	50%	4,786
23a	Building interior cleaners, N.E.C.	49%	1,034
23b	Computer programmers	49%	290
23c	Office machine repairer	49%	97
26	Dental laboratory technicians	48%	48
27	Recreation worker	47%	150
28a	Billing clerks	46%	214
28b	Police & detectives	46%	665
28c	Radio operators	46%	50
31	Inspectors, except construction, public	45%	160
32a	Managers & superintendents, building	44%	177
32b	Roofers & slaters	44%	130
34a	Photographic process workers	43%	110
34b	Social workers	43%	436
36	Drafters	42%	423
37a	Other engineering & science technicians	39%	585
37b	Plumbers & pipefitters	39%	535
39a	Clerical supervisors, N.E.C.	38%	297
39b	Personnel & labor relations workers	38%	450
39c	Receptionists	38%	635

Table 1 (continued)

42a	Air conditioning, heating & refrigeration mechanics	37%	285
42b	Flight attendants	37%	56
42c	Lodging quarters cleaners, except private households	37%	314
42d	Radiologic technologists & technicians	37%	112
42e	Sheriffs, bailiffs, constables, & marshalls	37%	78
47a	Computer, peripheral equipment	36%	335
47b	Estimators & investigators, N.E.C.	36%	505
49a	Collectors, bill & account	35%	85
49b	Mail handler, except post office	35%	195
49c	Typists	35%	1,400
52	Radio & television repairers	34%	180
53a	Attendants, recreation & amusement	33%	111
53b	Bank tellers	33%	449
53c	Cement & concrete finishers	33%	120
56a	Advertising agents & sales workers	32%	93
56b	Stock & bond sales agents	32%	131
56c	Structural metal craft workers	32%	112
59a	Cooks, except private households	31%	1,250
59b	Dental assistants	31%	155
59c	Electricans	31%	690
59d	Job & die setters, metal	31%	136
59e	Library attendants & assistants	31%	175
59f	Other construction craft workers	31%	109
65	Electric power line installers & repairers	30%	144

Other Relevant Statistics:

. All occupations, total	20%	103,355
. Professional, technical & kindred workers	29%	15,967

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* An occupation must have met three criteria to be considered for inclusion in Table 2: (a) at least +30% projected percent change in employment between 1974 and 1985; (b) at least 48 thousand persons projected for employment in the occupation in 1985; and (c) applicability to Vocational Education training.

SOURCE: Max L. Carey, "Revised Occupational Projections to 1985", Monthly Labor Review, November 1976, pp. 13-14.

Table 2

Large Civilian Occupations: Size of Occupations

Priority Ranking for Individual Occupations

The following is a list of the top 65 occupations ranked according to the total number of persons projected to be employed in the occupation in 1985. *

Rank	Occupation	Projected Employment In 1985 (# in Thousands)	Projected Percent Change 1974-1985
1	Secretaries	4,786	50%
2	Other clerical workers, N.E.C.	2,478	85%
3	Nurses aides, orderlies	1,506	64%
4	Typists	1,400	35%
5	Cooks, except private households	1,250	31%
6	Building interior cleaners, N.E.C.	1,034	49%
7	Practical nurses	965	97%
8	Electricans	690	31%
9	Police & detectives	665	46%
10	Receptionists	635	38%
11	Child care workers, except private households	627	56%
12	Other engineering & science technicians	585	39%
13	Plumbers & pipefitters	535	39%
14	Teacher aides, except school monitors	507	88%
15	Estimators & investigators, N.E.C.	505	36%
16	Personnel & labor relations workers	450	38%
17	Bank tellers	449	33%
18	Social workers	436	43%
19	Drafters	423	42%
20	Excavating, grading & road machine operators	420	52%
21	Computer, peripheral equipment	335	36%
22	Lodging quarters cleaners, except private households	314	37%
23	Clerical supervisors, N.E.C.	297	38%
24	Computer programmers	290	49%
25	Health aides, except nursing	288	60%
26	Air conditioning, heating & refrigeration mechanics	285	37%
27	Clinical laboratory technologists	236	52%
28	Billing clerks	214	46%
29	Other health technologists & technicians	208	110%
30	Mail handlers, except post office	195	35%
31	Bulldozer operators	190	51%
32	Radio & television repairers	180	34%
33	Managers & Superintendents, building	177	44%
34a	Garbage collectors	175	72%
34b	Library attendents & assistants	175	31%
36a	Computer system analysts	160	65%
36b	Inspectors, except construction, public	160	45%
38	Dental assistants	155	31%
39	Recreation workers	150	47%

Table 2 (continued)

40	Electric power installers & repairers	144	30%
41	Job & die setters, metal	136	31%
42	Stock & bond sales agents	131	32%
43	Roofers & slaters	130	44%
44	Cement & concrete finishers	120	33%
45	Surveyors	116	59%
46	Other technicians, except health, engineering & science	113	80%
47a	Radiologic technologies & technicians	112	37%
47b	Structural metal craft workers	112	32%
49	Attendants, recreation & amusement	111	33%
50	Photographic process workers	110	43%
51	Other construction craft workers	109	31%
52	Office machine repairers	97	49%
53	Welfare service aides	95	73%
54a	Advertising agents & sales workers	93	32%
54b	Data processing machine repairers	93	86%
56	Collectors, bill & account	85	35%
57	Sheriffs, bailiffs, constables & marshalls	78	37%
58a	Boilermakers	62	55%
58b	Opticans, lens grinders, polishers	62	59%
60	Dental hygenists	58	158%
61	Flight attendents	56	37%
62	School monitors	55	59%
63a	Asbestos & insulation workers	50	67%
63b	Radio operators	50	46%
65	Dental laboratory technicians	48	48%

Other Relevant Statistics:

. All occupations, total	103,355	20%
. Professional, technical & kindred workers	15,967	29%

* An occupation must have met three criteria to be considered for inclusion in Table 3: (a) at least +30% projected percent change in employment between 1974 and 1985; (b) at least 48 thousand persons projected for employment in the occupation in 1985; and (c) applicability to Vocational Education Training.

SOURCE: Max L. Carey, "Revised Occupational Projections to 1985", Monthly Labor Review, November 1976, pp. 13-14.

Table 3

Large Civilian Occupations: Percent Growth Priority Ranking for Occupational Areas

The following are the 20 occupational areas classified under Professional, Technical and Kindred Workers category ranked according to their projected percent change in employment between 1974 and 1985.

Rank	Occupational Areas	Projected Percent Change 1974-1985
1	Health technologist and technicians	70%
2	Computer specialists	55%
3	Medical workers, except technicians	50%
4	Technicians, except health, engineering & science	46%
5	Social scientists	43%
6	Engineering and science technicians	40%
7	Mathematical specialists	39%
8	Other professional & technical workers	35%
9	Clerical workers	34%
10	Writers, artists, & entertainers	32%
11	Service workers	28%
12	Engineers, technical	25%
13	Life & physical scientists	23%
14	Managers, officials & proprietors	22%
15	Crafts & kindred workers	20%
16	Sales workers	16%
17	Operators	9%
18	Laborers, except farm	9%
19	Teachers	6%
20	Farmers & farm workers	-39%

Other Relevant Statistics:

. All occupations, total	20%
. Professional, technical & kindred workers	29%

SOURCE: Max L. Carey, "Revised Occupational Projections to 1985", Monthly Labor Review, November 1976, pp. 13-14.

APPENDIX C

LIST OF MILITARY COURSES IDENTIFIED AS INITIAL CANDIDATES FOR CONVERSION TO CIVILIAN USE

APPENDIX C

List of Military Courses Identified as Initial Candidates for Conversion to Civilian Use

Title	Course Number	Source *	Project ID Number
Allergy/Immunology Specialist	5AZY91234	Air Force, Lackland, TX	435
Introduction to Allergy	50ZY9300	Air Force, Lackland, TX	439
Animal Technician	5AZY908X1	Air Force, Brooks, TX	432
Baking	800-94D20	Army, Ft. Lee, VA	181
*Behaviorial Science Specialist	302-91G10	Army, Ft. Sam Houston, TX	45
Biomedical Equipment Technician-Basic	B-198-0010	Navy, Navy Unit at Lowry AFB, CO	989
Biomedical Equipment Technician-X-ray	B-198-0011	Navy, Navy Unit at Lowry AFB, CO	990
Biomedical Technician - Electronic	B-198-0012	Navy, Navy Unit at Lowry AFB, CO	991
Blood Grouping, Collecting & Processing	311-F1	Army, Ft. Knox, KY	54

*Location is the address of the source initially contacted to obtain curriculum materials as per:

Department of the Army Pamphlet No. 351-4, US Army Formal Schools Catalog. Headquarters, Department of the Army. March 1975.

Air Force Manual AFH 50-5, Volume II, USAF Formal Schools Catalog. Department of the Air Force. 1 September 1974.

Catalog of Navy Training Courses, (CANTRAC), Annex A. Naval Education and Training Command. September 1974.

Title	Course Number	Source	Project ID Number
Boiler Technician, Class B	A-651-0011	Navy, Service School Command, San Diego, CA	839
(Pressure Fired) Boiler	A-651-0014	Navy, Service School Command, San Diego, CA	840
Builder - Concrete	A-730-0020	Navy, Construction Training Unit, Gulfport, MA	966
Builders - Heavy Construction	A-710-0018	Navy, Construction Training Unit, Gulfport, MA	946
Builder - Masonry	A-710-0017	Navy, Construction Training Unit, Gulfport, MA	945
* Cardiopulmonary Laboratory Specialist (Phase I & II)	5AL091630-1	Air Force, Sheppard, TX	678
Chemical Analysis	832-95D30A	Army, Ft. Gordon, GA	194
CHAP & Child Advocacy Management Course	30ZR9100	Air Force, Sheppard, TX	623
Clinical Nuclear Medicine Technician - Phase One	B-311-0016	Navy, National Naval Medical Center, Bethesda, MD	1005
Clinical Nuclear Medicare Technician - Phase Two	B-311-A016	Navy, National Naval Medical Center, Bethesda, MD	1006
* Clinical Specialist (Primary Technical)	300-91C20	Army, Ft. Sam Houston, TX	39
Commissaryman Course in Sanitation & Basic Mathematics	J-800-0040	Navy, Mare Island, CA	967
Commissaryman Course in Nutrition & Menu Planning	J-800-0041	Navy, Mare Island, CA	968
Commissaryman Course in Applied Cooking I	J-800-0042	Navy, Mare Island, CA	969

APPENDIX C (continued)

Title	Course Number	Source	Project ID Number
Commissaryman Course in Applied Cooking II	J-800-0043	Navy, Mare Island, CA	970
Commissaryman Course in Stock Control, Subsistence Reccrds & Returns	J-800-0045	Navy, Mare Island, CA	971
Conference Leadership	7A-F3	Army, Ft. Monmouth, NJ	250
Continuous Photoprocessing Specialist	3ABR23330-0	Air Force, Lowry, CO	482
(Advanced) Continuous Photoprocessing Technician	3AAR23370	Air Force, Lowry, CO	484
Cook	800-94B20	Army, Ft. Jackson, SC	179
Cooking	800-94B20	Army, Ft. Lee, VA	180
Crime Laboratory Photography	832-95D30B	Army, Ft. Gordon, GA	195
Criminal Investigation	832-95D20	Army, Ft. Gordon, GA	193
Cytotechnologist	B-311-0036	Navy, Navy School of Health Science, San Diego, CA	1012
Cytology Technician - Basic	B-311-0030	Navy, Region Medical Center, San Diego, CA	1011
Dental Administration	330-F1	Army, Ft. Sam Houston, TX	69
Dental Fixed Prosthetic Specialist	331-42D20	Army, Ft. Sam Houston, TX	72
Dental Hygienist	330-91E20	Army, Ft. Sam Houston, TX	68
Dental Specialist (Basic)	330-91E10	Army, Ft. Sam Houston, TX	67
Dental Laboratory Officer	50ZY9856	Air Force, Lackland, TX	442
Dental Laboratory Specialist (Basic)	TM 8-225	Army, Ft. Houston, TX	70

Title	Course Number	Source	Project ID Number
Dental Laboratory Specialist (advanced)	331-42D20	Army, Ft. Sam Houston, TX	71
* Dialysis Technician	300-F2	Army, Walter Reed Army Medical Center, Washington, DC	42
(Packard) Diesel Engine	J-651-0451	Navy, Fleet and Mining Warfare Training Center, Charleston, SC	759
(Waukesha) Diesel Engine (WEB)	J-651-0473	Navy, Fleet and Mining Warfare Training Center, Charleston, SC	760
(Packard) Diesel Engine Overhead (PAO)	J-652-0040	Navy, Fleet and Mining Warfare Training Center, Charleston, SC	765
Document Examination	832-95D30C	Army, Ft. Gordon, GA	196
Electroencephalographic Technician	5AZY909X2	Air Force, Lackland, TX	434
Electroencephalograph Specialist	311-91F30	Army, Ft. Sam Houston, TX	51
Electronics Technician - Miniature Electronic Repair Program (MERP)	A-100-0034	Navy, Norfolk Station, VA	720
Energy Management	A-4A-0037	Navy, Naval Construction Battalion Center, Port Hueneme, CA	918
Engineer Construction Officer	4A-F1	Army, Ft. Belvoir, VA	207
Engineer Construction Contracting	4A-F4	Army, Ft. Belvoir, VA	208
Engineman Basic (ENB)	J-652-0474	Navy, Fleet and Mine Warfare Training Center Charleston, SC	768
* Environmental Health Specialist	5ABY90730	Air Force, Brooks, TX	431
* Environmental Health Specialist	322-91510	Army, Ft. Sam Houston, TX	65
* Environmental Protection	5AZY907X0-1	Air Force, Brooks, TX	427

Title	Course Number	Source	Project ID Number
Environmental Protection	A-4A-0036	Navy, Naval Construction Battalion Center,	917
Equipment Operators - Asphalt Paving & Plant Operation	A-730-0017	Navy, Construction Training Unit, Gulfport, MS	963
Eye, Ear, Nose & Throat Specialist	300-91U10	Army, Ft. Sam Houston, TX	40
Faculty Development Course	520-F3	Army, Ft. Sam Houston, TX	100
Fingerprint Examination	832-95D30D	Army, Ft. Gordon, GA	197
Firearms Examination	832-95D30E	Army, Ft. Gordon, GA	198
Food Advisor/Technician	8E-941A	Army, F.. Lee, VA	373
Food Advisor/Technician	8E-4114	Army, Ft. Lee, VA	375
(Hospital) Food Service	800-94F40	Army, Walter Reed Army Medical Center, Washington, DC	83
* (Hospital) Food Service	800-94F20	Army, Fitsimmons General Hospital, Denver, CO	82
Geodetic Computing	412-82E20	Army, Ft. Belvoir, VA	81
* Hearing Conservation Program	5AZY907X0-3	Air Force, Brooks, TX	429
Histology Technician - Basic	B-311-0040	Navy, Naval Regional Medical Center, San Diego,	1013
Industrial Hygiene Measurements	5AZY907X0-2	Air Force, Brooks, TX	428
* Industrial Radiological Hazards	5AZY907X0-4	Air Froce, Brooks, TX	430
(Advanced) Inhalation Therapy & Anesthesia Systems	3AZR40370-7	Air Force, Sheppard, TX	642

Title	Course Number	Source	Project ID Number
(Still) Journalism	3AZR23512-0	Air Force, Lowry, CO	485
Law Enforcement	831-95C20	Army, Ft. Gordon, GA	192
Law Enforcement Supervisor	3APR81132	Air Force, Lackland, TX	616
Law Enforcement Supervisor	3AZR81172-2	Air Force, Lackland, TX	619
Law Enforcement	830-95B20	Army, Ft. Gordon, GA	189
Laboratory Technician - Basic	B-311-0011	Navy, Naval Regional Medical Center, Oakland, CA	1004
(Civil) Law Paraprofessional	512-71D20/50	Army, The Judge Advocate General's School, Charlottesville, VA	96
Medical Electronic Safety Methods & Maintenance Management	3AZR40370-7	Air Force, Sheppard, TX	638
Medical Entomology & Environmental Ecology	B-00-1100	Navy, Navy Disease Vector Ecology and Control Center, Jacksonville, FL	985
Medical Entomology & Pest Control Technology	B-00-1200	Navy, Disease Vector Ecology and Control Center, Jacksonville, FL	
Medical Equipment Maintenance (advanced)	4B-202A	Army, Fit immons General Hospital, Denver, CO	209
Medical Equipment Maintenance (basic)	4B-F2	Army, Fit immons General Hospital, Denver, CO	211
Medical Equipment Maintenance (basic)	198-35G20	Army, Medical Optical Maintenance Agency, Denver, CO	26

	Title	Course Number	Source	Project ID Number
	Medical Equipment Maintenance (advanced)	198-35G30	Army, Medical Optical Maintenance Agency, Denver, CO	27
	Medical Equipment Maintenance (supplementary & refresher	198-F1	Army, Medical Optical Maintenance Agency, Denver, CO	31
*	Medical Laboratory Specialist (basic)	311-92B10	Army, Ft. Sam Houston, TX	52
*	Medical Laboratory Procedures (advanced)	311-92B30	Army, Ft. Sam Houston, TX	53
	Medical Logistics Management Course	8B-F20	Army, Ft. Sam Houston, TX	324
	Medical Photography Technician	B-400-0010	Navy, National Naval Medical Center, San Diego, CA	1025
	Medical Records Management Air Force	3AZR90670-2	Air Force, Sheppard, TX	663
	Medical Services Technician	B-300-0016	Navy, School of Health Sciences, San Diego, CA	993
	(Basic) Medical Specialist	300-91B10	Army, Ft. Sam Houston, TX	37
	Medical Technologist Technician	B-311-9925	Navy, National Naval Medical Center, Bethesda, MD	1010
	Military Police Investigation	830-F8	Army, Ft. Gordon, GA	191
	Neuropsychiatry Technician	B-302-0045	Navy, Regional Medical Center, Port Hueneme, CA	1002
	Nuclear Power Fundamentals Course	A-661-0037	Navy, Mare Island, CA	938
	Nuclear Power Plant Components Welding	A-701-0028	Navy, Service School Command, San Diego, CA	787
	(Family) Nurse Practitioner Course	B-6F-0013	Navy, Regional Medical Center, San Diego, CA	983

	Title	Course Number	Source	Project ID Number
	(Ob/Gyn) Nurse Practitioner Course	B-6F-0012	Navy, Regional Medical Course, San Diego, CA	982
	Ocular Technician	B-300-0020	Navy, National Naval Medical Center, Bethesda, MD	996
	Operating Room Specialist (Basic)	301-91D10	Army, Ft. Sam Houston, TX	43
*	Operating Room Technician	B-301-0038	Navy, National Naval Medical Center, Bethesda, MD	1060
	(Orientation to) Operating Room Technique	B-6F-0011	Navy, Regional Medical Center, Charleston, SC	981
*	Ophthalmology Surgical Technician	5AZY91270	Air Force, Brooks, TX	436
*	Optical Laboratory Specialist	311-42E20	Army, Medical Optical Maintenance Agency, Denver, CO	50
	Opticalman Class A	A-670-0018	Navy, Air Technical Training Center, Great Lakes, IL	775
	Optician Technician	B-311-0023	Navy, Ophthalmic Support & Training Center, Williamsburg, VA	1009
*	Orthopedic Specialist	304-91H10	Army, Ft. Sam Houston, TX	49
	Orthotic Specialist	304-42C10	Army, Ft. Sam Houston, TX	48
	Patient Administration	7M-F3	Army, Ft. Sam Houston, TX	308
	Patient Administration Specialist (basic)	513-71G10	Army, Ft. Sam Houston, TX	98
	Pediatric Nurse Practitioner	30ZR9756B	Air Force, Sheppard, TX	630
	Pharmacy Specialist	312-91Q10	Army, Ft. Sam Houston, TX	55
	Pharmacy Technician	B-312-0025	Navy, School of Health Sciences, San Diego, CA	1014

Title	Course Number	Source	Project ID Number
Photographic Laboratory Operation	400-84G20	Army, Ft. Monmouth, NJ	75
(Still) Photography	400-84B20	Army, Ft. Monmouth, NJ	73
(Motion Picture) Photography	400-84C20	Army, Ft. Monmouth, NJ	73
(Still) Photo Laboratory	3AZR23374-1	Air Force, Lowry, CO	478
(Color) Photo Process	3AZR23172	Air Force, Lowry, CO	481
Photoprocessing Central Specialist	3ALR23331-0	Air Force, Lowry, CO	483
Physical Therapy	6H-3418	Army, Ft. Sam Houston, TX	247
Physical Therapy Specialist	303-91J10	Army, Ft. Sam Houston, TX	46
Physical & Occupational Therapy Technician	B-303-0051	Navy, Regional Medical Center Oakland, CA	1003
Physical Security	830-F3	Army, Ft. Gordon, GA	190
Physical Assistant (Phase I & II)	5A9091770	Air Force, Sheppard, TX	680
Physicians' Assistant Program	64-911A	Army, Ft. Sam Houston, TX	246
Polygraph Examiner Training	7H-F11	Army, Ft. Gordon, GA	304
Precision Photographic System Repairman	3ABR40430	Air Force, Lowry, CO	513
Precision Photographic System Technician	3AAR40470	Air Force, Lowry, CO	514
Psychiatric Specialist (basic)	302-91F10	Army, Ft. Sam Houston, TX	44
* Radiological Safety Course	7KF3	Army, Aberdeen Proving Ground, MD	305
Advanced Respiratory Care	50ZY9566-1	Air Force, Brooks, TX	440
Respiratory Care (advanced)	50ZY9756	Air Force, Brooks, TX	441
Safety Methods & Maintenance Management	3ABR40330-2	Air Force, Sheppard, TX	637
* (Fundamentals of USAF) Safety Programs	30ZR8124X	Air Force, Lowry, CO	462

Title	Course Number	Source	Project ID Number
Safety Supervisor	3AAR24170-2	Air Force, Lowry, CO	486
Safety Technician	G-3ABR8124X	Air Force, Lowry, CO	1090
(1200 PSI) Steam Generating Plant Operation	A-651-0038	Navy, Service School Command, Philadelphia, PA	897
Steelworkers Class C7	A -711-0018	Navy, Construction Training Unit, Gulfport, MS	950
Steelworkers - Maintenance Welding Techniques	A -701-0037	Navy, Construction Training Unit, Gulfport, MS	939
Steelworkers - Sheetmetal	A-703-0010	Navy, Construction Training Unit, Gulfport, MS	941
Steelworkers - Welder Certification - Structional & Pipe	A-101-0038	Navy, Construction Training Unit, Gulfport, MS	940
(Construction) Surveying	412-82B20	Army, Ft. Belvoir, VA	79
(Geodetic) Surveying	412-82D20	Army, Ft. Belvoir, VA	80
(Advanced Geodetic Surveyor	412-F2	Army, Ft. Belvoir, VA	82
Technical Curriculum Development Course (TECDEX)	A-012-0031	Navy, Fleet Training Center, Norfolk, VA	708
Veterinary Specialist	321-91T20	Army, Walter Reed Army Medical Center, Washington, DC	54
Workshop for Middle Managers	7A-F1	Army, Ft. Monmouth, NJ	249
X-Ray Specialist	313-91P10	Army, Ft. Sam Houston, TX	56
X-Ray Technician	B-313-0026	Navy, Regional Medical Center, San Diego, CA	1013

APPENDIX D

COURSE DESCRIPTIONS

APPENDIX D

Course Descriptions

1. Behavioral Science Specialist

302-91G10

Location: Academy of Health Sciences, Fort Sam Houston, Texas 78234.

Length: P-10 weeks. M-9 weeks.

MOS for Which Trained: Social Work/Psychology Specialist (91G10).

Purpose: To prepare the student with a broad background of the social work and psychology fields and provide him with a working knowledge of various skills which will enable him to function as an assistant to the social work and psychology officers. To provide selected enlisted personnel with sufficient knowledge, skills and attitudes to begin working effectively in US Army settings where necessary professional social work and psychological supervision is available.

Scope: A general knowledge of the fields of social work and psychology as they relate to the social, cultural and psychological determinants of behavior and the role of the enlisted specialist in relation to professional staff is provided. A working knowledge of the basic skills and techniques in interviewing and recording of social and psychological data.

Prerequisites: Evidence of emotional stability and maturity. Ability to communicate effectively orally and in writing. Standard score of 100 or higher in aptitude area GT. Ten months or more of active duty remaining after completion of the course. No security clearance required.

Quota Control: Quotas are allocated by HQDA.

Funding: By HQDA, or BAMC. See paragraph on funding in the Introduction.

(US Army Formal Schools Catalog, 1 March 1975, page 5-30-6.)

2. Cardiopulmonary Laboratory Specialist

3ALR91630-PDS Code PIV-DOD300-Cat A-Sheppard/8 wk/ AFSC*-Sep 74

Tng to provide asst to cardiologists and pulmonary physiologists in exam, eval, diagnosing and treating cardiopulmonary diseases and injuries by performing a broad spectrum of diagnostic and therapeutic procd such as admin electrocardiograms, phonocardiograms, vectorcardiograms, stress tests, defibrillation techniques, pulmonary function studies, intermittent pos pressure breathing, blood gas anlys, cardiac catheterization and op and maint of diagnostic equip. Maj areas of study are anatomy, physiology, med terminology, care of cardiovascular disorders, care of pulmonary disorders, inhalation therapy and related diagnostic proc and equip.

Prerequisites: Possess AFSC 90250/70; 3 yr act dy svc and min of 2 yr experience at the 5 or 7 skill level; 24 mo retainability on compl of Phase II; min aptitude level of Gen 60: med qual for worldwide svc with no hist of emotional instability.

Admin Instruc: Stu attend this course TDY en route to the 20-wk Phase II crs 5ALO91630-1 at a designated hospital.
Quotas controlled by ATC/SGHE.

*AFSC 91630 is awarded upon compl of crs 5ALO91630-1.

(USAF Formal Schools Catalog, Vol. II (C3), 1 June 1975, page 3-125.)

3. Clinical Specialist

300-91C20

Location: Brooke General Hospital, Fort Sam Houston, Texas 78234.
DeWitt Army Hospital, Fort Belvoir, Virginia 22060.
Fitsimmons General Hospital, Denver, Colorado 80240
Letterman General Hospital, The Presidio, San Francisco, California 94129.
Madigan General Hospital, Tacoma, Washington 98431.
US Army Hospital, Fort Gordon, Georgia 30905.
Valley Forge General Hospital, Phoenixville, Pennsylvania 19660.
William Beaumont General Hospital El Paso, Texas 79920.
Womack Army Hospital, Fort Bragg, North Carolina 28307.

Length: P-40 weeks. M-27 weeks.

MOS for Which Trained: Clinical Specialist (91C20).

Purpose: To provide enlisted personnel with a working knowledge to supervise and perform patient-care duties appropriate to hospital and field medical assistants.

Scope: Military publications and correspondence; medical records and reports; interpersonal relations; techniques of instruction; techniques of management; Army Medical Field Service; emergency medical and dental care; medical management of mass disaster casualities; military preventive medicine; introduction to medical science; pharmacology and patient care; concepts of patient care; advanced principles and practices of patient care; medical surgical nursing; mental health and mental illness; care of the obstetrical patient and the new born; care of the pediatric patient; dispensary procedures; surgery in the Army dispensary and health facility; clinical experience.

3. Clinical Specialist (continued)

Prerequisites: Must have completed the 10 weeks of training in accordance with ASubjScd 8-91A10, conducted at the US Army Medical Training Center, (USAMTC), or be eligible for attendance at this training with a waiver of grade and skill level for consecutive training in MOS 91C. Students entering this course directly from the USAMTC, and others requiring refresher patient care and treatment experience will receive 6 weeks applicatory training at the hospital conducting Course 300-91C20 immediately prior to entering Course 300-91C20. High school graduate or the equivalent as measured by GED tests. Credit for a high school level course in mathematics or have a standard score of 45 or higher on GED test 5, high school level. An interview by and written recommendation from an Army Nurse Corps officer or, when not available, a Medical Corps officer, as to the applicant's interest in patient care, his potential, and physical suitability for the course. Standard score of 100 or higher in apptitude area GT. Twenty-four months or more of active duty service remaining after completion of the course. No security clearance required.

Quota Control: Quotas are allocated by HQDA.

Funding: By HQDA.

Special Information: All applications must specify the individual's qualifications to include a statement that the individual has credit for a course in high school mathematics or indicate the score received on GED test 5, high school level. A statement of consent to be appointed in a specialist grade upon completion of the course must be included for those NCO's in grades below E-7. The waiver authority is retained by The Surgeon General, Department of the Army. A request for waiver may be submitted with th school application.

(US Army Formal Schools Catalog, 1 March 1975, page 5-30-2.)

4. Dialysis Technician

300-F2

Location: Walter Reed General Hospital, Walter Reed Army Medical Center, Washington, D:C. 20012.

Length: 24 weeks.

MOS for Which Trained: None. Additional Skill Identifier M3 added to MOS 91B, 91C, and 91D.

Purpose: To develop in enlisted personnel a working knowledge and skill in the techniques of peritoneal dialysis and hemodialysis, and the patient care procedures practiced in a renal service.

Scope: Technical aspects of dialysis and necessary patient monitoring under nurse and/or physician supervision, basic and advanced nursing procedures under nurse supervision, preparing the patient and assisting the physician in arteriovenous shunt construction and insertion, laboratory determinations necessary for the efficient operation of a renal service, maintenance of dialysis machinery, and the stockage and maintenance of materials and supplies peculiar to a dialysis unit.

Prerequisites: Qualified as a Medical Specialist (91B); Clinical Specialist (91C); or Operating Room Specialist (91D). High school graduate or the equivalent as measured by GED tests. Must have credit for high school level course in chemistry or successful completion of USAFI courses E285 and E286. No history of chronic recurrent skin disorders which may be subject to infection. No history of allergic reaction to cleaning agents, antiseptics, or disinfectants. No undue aversion to the sight of blood. Good hearing and manual dexterity. Twenty months or more of active duty service remaining after completion of the course. Standard score of 100 or higher in aptitude area GT. No security clearance required.

Quota Control: Quotas are allocated by TSG/DA.

Funding: See paragraph on funding in the Introduction.

(US Army Formal Schools Catalog, 1 March 1975, page 5-80-3)

5, Hospital Food Service Specialist

800-94F20

Location: Fitzsimons General Hospital, Denver, Colorado 80240.

Length: 12 weeks.

MOS for Which Trained: Hospital Food Service Cook (94F20).

Purpose: To qualify enlisted personnel to perform food preparation and distribution activities necessary in patient food service. To qualify them to apply diet therapy knowledge to the preparation of modified food required in patient feeding.

Scope: Provides enlisted personnel with the abilities to prepare regular and modified diet foods according to standard recipes: direct less skilled cooks in preparation of modified diet foods; apply standard food preparation techniques to produce quality food; apply standard sanitation principles to self, equipment, and area in which work is performed; make modifications in protein, fat, carbohydrates, sodium, calories and consistency to the regular diet to comply with a specific prescription; to use diet therapy instruments necessary in diet therapy management; and, to establish harmonious, patient oriented rapport with nursing service.

Prerequisites: Grade E-2 or higher. Eleven or more months' active duty service remaining upon completion of course. Standard score of 100 or higher in aptitude area GT. No security clearance required.

Quota Control: Quotas are allocated by HQDA.

Funding: By HQDA or Fitzsimons General Hospital. See paragraph on funding in Introduction.

(US Army Formal Schools Catalog, 1 March 1975, pa 5-80-3)

6. Medical Laboratory Procedures (Advanced)

311-92B30

Location: Academy of Health Sciences, Fort Sam Houston, Texas 78234.

Length: 50 weeks.

MOS for Which Trained: Medical Laboratory Specialist (92B30).

Purpose: To provide enlisted medical laboratory personnel with a working knowledge of medical laboratory technology in order that they may become competent technical specialists, and/or noncommissioned officers-in-charge of military medical laboratories. To develop proficiency in clinical, investigative, and control procedures employed in military medical laboratories.

Scope: A working knowledge of the following subject areas is provided: detection and quantitative estimation of the more common poisons, performance of a complete urinalysis, and the more common procedures used in clinical chemistry and the mathematics involved in determining clinical chemistry results; principles and techniques utilized in cytological screening; routine laboratory procedures in histology techniques; clinical parasitology, including life cycles, epidemiology, and identification of parasites; hematological procedures and their application to a clinical laboratory; application of the science of immunology as an aid in the diagnosis of disease; immunohematological procedures, including collecting, processing, testing, storing, and issue of whole blood and blood components; principles and methods utilized in the cultivation, isolation, and identification of bacteria of clinical importance; clinical aspects and technical procedures employed in medical mycology; and virological methods as applied to a clinical laboratory.

A general knowledge of the following subject areas is provided: anatomy and physiology, with emphasis on the physiological implications of clinical pathology; science of immunology; administrative and management techniques as practiced at the medical laboratory level; and medical supply terminology, principles and procedures which apply to medical laboratories.

6. Medical Laboratory Procedures (Advanced) (continued)

Prerequisities: Qualified as a Medical Laboratory Specialist (92B20) with a minimum of 1 year of experience in MOS 92B20. Credit for high school level courses in algebra and science (USAFI algebra courses PA 164 and PA 165 and chemistry courses E 285 and E 286 fulfill this prerequisite). Normal color vision (using standard color discrimination plates-applicant must not miss more than 3 plates). Other physical and mental requirements as outlined in AR 611-201. Twenty four months or more of active duty remaining after completion of this course. Standard score of 100 or higher in aptitude area GT. No security clearance required.

Quota Control: Quotas are allocated by HQDA.

Funding: By HQDA.

Special Information: Applications indicating specific qualifications for attendance will be forwarded in accordance with chapter 11, AR 614-200 through The Surgeon General, ATTN: DASG-PTT-T, Department of the Army, Washington, D.C. 20314, for approval. Noncommissioned officers and senior specialists who have attained their MOS without adequate technical training should attend this course if not technically qualified to perform all of the duties of a Medical Laboratory Specialist (MOS 92B30). The one year of experience in MOS 92B20 will be waived by The Surgeon General for exceptionally well qualified personnel on recommendation by a pathologist or clinical laboratory officer.

(US Army Formal Schools Catalog, 1 March 1975, page 5-31-3.)

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7. Medical Laboratory Specialist (Basic)

311-92B20

Location: Academy of Health Sciences, Fort Sam Houston, Texas 78234.

Length: P-14 weeks. M-9 weeks.

MOS for Which Trained: Medical Laboratory Specialist (92B20).

Purpose: To provide enlisted personnel with a working knowledge of basic techniques and principles of medical laboratory procedures.

Scope: Clinical chemistry, urinalysis, hematology, immunohematology, serology, parasitology, and bacteriology; mathematics; practical training in patient contact.

Prerequisites: Must have credit for high school level courses in chemistry and algebra. Normal color vision (using standard color discriminating plates, must not miss more than 3 plates). No aversion to sight of blood. Other physical and mental requirements as outlined in AR 611-201. Thirteen months or more of active duty service remaining after completion of course. Standard score of 100 or higher in apptitude area GT. No security clearance required.

Quota Control: Quotas are allocated by HODA

Funding: By AMEDD or BAHC. See paragraph on funding in the Introduction. (US Army Formal Schools Catalog, 1 March, 1975, page 5-31-4.)

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8. Operating Room Specialist (Basic)

301-91D20

Location: Academy of Health Sciences, Fort Sam Houston, Texas 78234.

Length: P-12 weeks, M-5 weeks, 1 day.

MOS for Which Trained: Operating Room Specialist (91D20).

Purpose: To develop in enlisted personnel a working knowledge of sterilization procedures, sterile technique and patient care procedures practiced in an operating room and central material section.

Scope: A working knowledge of the following subject areas is provided-principles and methods of sterilization and disinfection used in the hospital and application of those principles to the various types of supplies prepared and used in the operating room and central material section; identification and care of surgical instruments, sutures, suture needles, knife blades, rubber and plastic items, linen, chrome ware, catheters, and loading of the autoclave with supplies; duties of the scrub specialist; duties and responsibilities of the circulator; and preoperative skin preparation of the patient. A general knowledge of the following subject areas is provided-pathogenic microorganisms; drugs and anesthetic agents; anatomy and physiology; care and maintenance of the operating room and CMS equipment; layout of an operating room suite and methods used to disseminate information; assisting with the administration of anesthesia and treatment of emergencies; ethical responsibilities to the patient; preparing medications for use by the surgeon; processing of specimens and septic case technique; explosive and radiation hazard in the operating room and safety precautions.

Prerequisites: Qualified as a Medical Corpsman (91A10). High school graduate or the equivalent as measured by GED tests. No history of chronic, recurrent skin disorders which may be subject to infection. No history of allergic reaction to cleaning agents, antiseptics, or disinfectants. Good hearing and manual dexterity. Ability to stand for long periods of time. No undue aversion to sight

8. Operating Room Procedures (Basic) (continued)

of blood. Eleven months or more of active duty service remaining after completion of the course. Standard score of 100 or higher in aptitude area GT. No security clearance required.

Quota Control: Quotas are allocated by HQDA.

Funding: By HQDA or BAMC. See paragraph on funding in the Introduction.

Special Information: The first, or didactic phase, of this course (6 weeks) will be conducted at the Medical Field Service School. For the second phase (6 weeks) students will be assigned to selected Army hospitals for applicatory training.

(US Army Formal Schools Catalog, 1 March 1975, page 5-30-5.)

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9. Ophthalmology Surgical Technician

5AZY91270-PDS Code WTN-DOD300-Brooks/5 wk-Apr 72

Crs provides adv supplemental tng to prepare amn to assist in occular eval and treatment of ophthalmic patients. Enables grad to perform visual screening tests; neutralizing of ophthalmic lenses; tangent visual fields; Goldmann perimetry; dundus photography, and spectacle fitting, adjusting and repair. Prepares grad to assist ophtholmologist in major and minor eye surgery utilizing procedures such as surgical instrumentation: aseptic and sterilization techniques; preparation of surgical packs and ocular dressings; administration of eye medications, anesthetics, and antibiotics; application of ocular dressings; obtaining eye culture and general preparation for surgery of preoperative ophthalmic patients.

Prerequisites: Airmen must have been awarded a Primary AFSC 91230 or 91270 and performed duty in their AFSC directly under the supervision of an ophthalmologist or optometrist for at least 6 months immediately preceding date of course. Basic knowledge of ocular anatomy; visual physiology and optics; medical ethics; surgical and medical technology;

surgical asepsis; ocular instruments; materia medica; anesthetic solutions; operating room procedures; emergency medical and surgical treatment, including ocular first aid; and patient transportation is "MANDATORY." Airmen must be in their second or subsequent enlistment. Exception may be made for those first term airmen who have been selected for re-enlistment and have indicated their intention to remain in the Air Force. High school or college level courses in general science, biology, and chemistry are desirable.

Quotas controlled by AMD/SG.

(USAF Formal Schools Catalog, Vol. II (C2), 1 June 1975, page 2-3)

10. Optical Laboratory Specialist

311-42E20

Location: US Army Medical Optical and Maintenance Agency, Denver, Colorado 80240.

Length: P-20 weeks. M-16 weeks.

MOS for Which Trained: Optical Laboratory Specialist (42E20).

Purpose: To provide enlisted personnel with a working knowledge to grind, polish and edge lenses in accordance with the prescription; to assemble spectacles, and operate and maintain optical equipment in an Army Ophthalmic Laboratory; to conduct visual screening, utilizing the Armed Forces Vision Tester; to provide spectacle ordering, minor repairing and spectacle fitting at Army Medical Facilities.

Scope: Basic optical theory and mathematics; interpretation of prescriptions and fabrication of spectacles to include cutting, edging, assembly, inspection, packing and mailing; repair of spectacles; maintenance and use of tools, equipment, and machinery used in the fabrication of spectacles; markup, blocking, grinding, finding, and polishing lens blanks; computation of lens curves; supply procedures and administration.

Prerequisites: Enlisted grades E-5 and below. Seventeen months or more of active duty service remaining after completion or course. Standard score of 100 or higher in aptitude area GM. Applicable physical and mental requirements listed in AR 611-201, Section III, for Optical Laboratory Specialist, MOS 42E. No security clearance required. Must have credit for high school algebra (USAFI algebra courses PA 164 and PA 165 fulfill this requirement), or, a score of 45 or higher on GED test 5.

Quota Control: Quotas are allocated by HQDA.

Funding: by HQDA.

(US Army Formal Schools Catalog, 1 March 1975, page 5-31-1)

11. Orthopedic Specialist

304-91H10

Location: Brooke General Hospital, Fort Sam Houston, Texas 78234.
Fitzsimons General Hospital, Denver, Colorado 80240.
Letterman General Hospital, San Francisco, California 94129.
Madigan General Hospital, Tacoma, Washington 98431.
Valley Forge General Hospital, Phoenixville, Pennsylvania 19660.
William Beaumont General Hospital El Paso, Texas 79920.
Walter Reed General Hospital, Washington, D.C. 20012.

Length: P-12 weeks.

MOS for Which Trained: Orthopedic Specialist (91H20).

Purpose: To provide enlisted personnel with a working knowledge to assist the physician with minor orthopedic surgery; to apply casts, splints and traction; and perform related tasks to treat and aid the healing process of orthopedic conditions as prescribed by a physician.

Scope: Anatomy, terminology, care and handling of orthopedic patients; plaster technique; traction technique and practical exercises.

Prerequisites: Qualified as Medical Corpsman, MOS: 91A10. Grade E-5 or below. Standard score of 100 or higher in aptitude area GT. Eleven or more months of active duty service remaining upon completion of the course. No security clearance required.

Quota Control: Quotas are allocated by HQDA.

Funding: By HQDA or appropriate hospital. See paragraph on funding in the introduction.

(US Army Formal Schools Catalog, 1 March 1975, page 5-30-6.)

12. Environmental Health Specialist

5ABY90730-PDS Code WSG-DOD322-Cat A-Brooks/aprx 11 wk/AFSC 90730/MASL D175037-Sep 74

Provides knowledge and skill to perform entry lyl dys as an Envmt Health Specialist. Tng incl: Sup procd, eff comm, communicable disease con, intl quarantine, med zoology, envmt sur. drinking water sup. dom waste mgt, industrial waste mgt, solid waste mgt, swimming pools and recreational areas, envmt pollution, illumination, vent, thermal stress, atmospheric sampling, toxic mat, industrial radn con, micro-wave hazards, tadioactive waste disposal, disaster preparedness response (chem, radl, biol, natural), med msl hazards, hearing conservation and noise hazard con tng which may lead to cert as a "Hearing Conservationist."

Prerequisites: Grad of crs 3AQR90010-2 (pers who already possess an AFSC in the Med or Dental career fld are exempt from this rqmt); min AQE aptitude percentile of Gen 60; clear voice without speech impediment; normal color vision. HS grad with crs in gen sci, biology, chemistry, and math desirable. Mental and phys ability to qual for govt veh license. Fgn stu ECL 65 MS.

USAF amn quotas controlled by ATC/RSSA; MAP, ANG and 6 mo Res quotas controlled by ATC/TTPP; all other quotas controlled by AMD/SG.

(USAF Formal Schools Catalog, Vol.II (C3), 1 June 1975, page 2-2.)

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13. Environmental Health Specialist

322-91S10

Location: Academy of Health Sciences, Fort Sam Houston, Texas 78234.

Length: P-7 weeks. M-6 weeks.

MOS For Which Trained: Preventive Medicine Specialist (91S10).

Purpose: To provide enlisted personnel with a working knowledge of the basic principles of military preventive medicine.

Scope: A general knowledge of Medical Service organization: medical statistics; chemistry; laboratory safety; preventable diseases and injuries; preventive medicine methods; a working knowledge of environmental sanitation and medical entomology.

Prerequisites: Standard score of 100 or higher in aptitude area GT. Credit for high school level courses in algebra and chemistry (USAFI algebra courses PA 164 and PA 165 and chemistry courses E285 and E286 fulfill this requirement). Physical and mental requirements as described in AR 611-201. Nine months or more of active duty service remaining after completion of course. No security clearance required.

Quota Control: Quotas are allocated by HQDA.

Funding: By HQDA or BAMC. See paragraph on funding in Introduction.

(US Army Formal Schools Catalog 1 March 1975, page 5-32-5.)

14. Environmental Protection

5AZY907X0-1-PDS Code SWA-DOD322-Brooks/aprx 2 wk-Jun 74

Water and air pollution technology, survey procd, and existing state and fed abatement and con criteria and std; community noise eval, and solid waste mgt.

Prerequisites: PAFSC 90770/90 (E-8 and E-9 are elig to attend). Off with AFSC 9766A and involved in the Envmt Protection Prgm are elig. One yr retainability upon compl of crs.

15. Fundamentals of USAF Safety Programs

3OZR8124X-PDS Code JUD-Lowry/1 wk 3 days-Sep 71

Fundamentals of USAF Safety Programs incl safety programs mgt, accident prevention programs, surveys and inspections, job hazards, hazards correction, traffic safety, off-duty recreation and safety educ. Designed for pers who have additional duties in safety programs.

Prerequisites: Possession of appropriate AFSC as specified in AMF 36-1 or amn/civ equiv.

Quotas controlled by ATC/TTPP.

(USAF Formal Schools Catalog, Vol. II (C3), 1 June 1975, page 3-28.)

16. Hearing Conservation Program

5AZY907X0-3-PDS Code SQ6-DOD322-Brooks/aprx 1 wk-Mar 75

Trains pers in areas of hearing conservation. Tng incl: phys acoustics: noise measurements; assessment of noise for Land Use Planning; assessment of auditory risk; undesirable eff of noise; assessment of potentially hazardous noise; conduct of the USAF Hearing Conservation Prgm; audiometry; dspn of noise exposed pers. Grad will certified as "Hearing Conservationist."

Prerequisites: PAFSC 90150/70/90; 90750/70/90 (amn in grades E-8 and E-9 are elig to attend). Other selected off, med techns and civ empl involved in direct spt of the USAF Hearing Conservation Prgm are elig to attend. Pers prev cert through prior crs attendance are not elig to attend. One year retainability upon compl of crs.

Quotas controlled by AMD/SG.

(USAF Formal Schools Catalog, Vol.II (C3), 1 June 1975, page 2-2.)

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17. Industrial Hygiene Measurements

5AZY907XO-2-PDS Code SWB-DOD322-Brooks/aprx 2 wk-Jun 74

Current methods for the evaluation and con of industrial hazards, specifically those generated by the use of chem agents and through exposure to extremes of heat and cold.

Prerequisites: PAFSC 90770/90 (E-8 and E-9 are elig to attend). Off with AFSC 9766A and involved in the Industrial Hygiene Measurements Pgrm are elig. One yr retainability upon compl of crs.

Quotas controlled by AMD/SG.

(USAF Formal Schools Catalog, Vol. II (C3), 1 June 1975, page 2-1.)

18. Industrial Radiological Hazards

5AZY907X0-4-PDS Code SWC-DOD322-Brooks/aprx 1 wk 2 days-Jun 75

Radiological health hazards investigation; risk assessment; selection of monitoring instm; pers exposure con from ionizing and nonionizing radn; app state, fed and USAF safety and health std.

Prerequisites: PAFSC 90770/90 (E-8 and E-9 are elig to attend.) Off with AFSC 9766A and involved in the Radl Hazards Prgm are elig. One yr retainability upon compl of crs.

Admin Instruc: Attendee not possesing math background equiv to 2 yr algebra should write USAFSAM/EDE, Brooks AFB, TX 78235, for copy of Programmed Instruc Math Workbook upon notification of selection to attend crs. Sug attendee bring electronic calculator.

Quotas controlled by AMD/SG.

(USAF Formal Schools Catalog, Vol. II (C3), 1 June 1975, page 2-2)

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19. Radiological Safety

FK-53

Location: US Army Ordnance Center and School, Aberdeen Proving Ground, Maryland 21105.

Length: P-3 weeks. M-2 weeks, 5 days.

MOS for Which Trained: None.

Purpose: To provide commissioned officer, warrant officer, enlisted and civilian personnel with a working knowledge of fundamental radiological safety principles and procedures and to qualify him to perform the duties of a radiological protection or control officer.

Scope: Working knowledge of aspects of radiological safety which are of interest to the Radiological Protection Officer or Radiological Equipment Custodian. Major areas of instruction are radioactivity and decay; radiation units; radiation shielding; radiation detection and decontamination; operation, calibration, and organizational maintenance of RADIAC instruments; methods of safe handling, use, and storage or radioactive material; environmental monitoring procedures; leakage test; transportation and disposal of radioactive materials: standards for protection, X-ray and associated equipment safety; radiation accident procedures; required reports and logs; hazards of nonionizing radiation; and major requirements of control agencies. Throughout the course, emphasis is placed on hazards and radiological safety requirements.

Prerequisites: Prior to reporting for this course each student is required to demonstrate a working knowledge of basic mathematics and radiation physics by successfully completing US Army Ordnance Center and School Chemical Subcourse 133 "Radiological Safety I Fundamentals."

19. Radiological Safety (continued)

Commissioned and Warrant officers. Member of the active Army or of a Reserve component who is assigned or under orders for assignment to a duty involving radiological safety. No security clearance required.

Civilian Personnel. Must be assigned or under orders for assignment to a position requiring training in radiological safety. No security clearance required.

Quota Control: Quotas are allocated by CG TRADOC.

Funding: See paragraph on funding in the Introduction.

Obligated Service for Active Army Commissioned and Warrant Officers: None.

Special Information: Send application for enrollment in Chemical Subcourse 133 to the Commandant, US Army Ordnance Center and School, ATTN: ATSL-TER-O, Aberdeen Proving Ground, Maryland 21005, not later than 45 days prior to reporting date for the course.

Selected enlisted personnel may attend this course upon application to the Commandant, US Army Ordnance Center and School, ATTN: ATSL-TE, Aberdeen Proving Ground, Maryland 21005. These enlisted personnel will have a minimum GT score of 110, and anticipated assignment as Radiological Protection officers as described in AR-40-14. Above listed prerequisite also applies.

Copies or orders for personnel attending course will be directed to the Commandant, US Army Ordnance Center and School, ATTN: ATSL-SE, Aberdeen Proving Ground, Maryland to arrive NLT 10 days prior to reporting date.

Students will report to the US Army Ordnance Center and School, Aberdeen Proving Ground-Aberdeen Area. However, classes will be conducted at APG-Edgewood Area.

(US Army Formal Schools Catalog, 1 March 1975, page 4-[illegible]-1.)

20. Safety Specialist

3ALR24130-1-PDS Code AK3-DOD493-Lowry/6 wk 3 days/ AFSC 24130*/MASL D122023-Aug 73

Survey areas and activities for accident hazards, analyze accident statistical data, assist in accident investigations, review engineering sketches and drawings to eliminate hazards, provide safety staff supervision during hazardous operations, assure compliance with OSHA rqmt, and conduct safety education and accident prevention programs.

Prerequisites: High sch grad or equiv. Input from any 5-level specialty. Normal color vision. SECRET scty clnc. Fgn stu ECL 70.

*A and B shreds can only be awarded at base level when an individual actually fills an authorized manming position calling for the shred. It is desirable for pers tng for an A shred to attend crs 3OZR 7524-74.

Quotas controlled by ATC/TTPP.

(USAF Formal Schools Catalog, Vol. II (C3), 1 June 1975, page 3-40.)

APPENDIX E

MILITARY COURSE BIBLIOGRAPHIES

COURSE BIBLIOGRAPHY
of

COURSE: (1) Behavioralist Science Specialist Course 302-91G10

SOURCE: Fort Sam Houston, Texas U.S. Army

Program or Plan of Instruction:

1. Program of Instruction for 302-91G10, Behavioralist Science Specialist Course, MOS: 91G10. 10 February 1976.

Lesson Plans:

2. Lesson Plan 50-240-200: Human Relations: Issues Concerns, Race, Sex and Ethnic Background.
3. Lesson Plan 50-240-404: Basic Sociology (and corresponding mimeograph sheets).
4. Lesson Plan 50-240-512: Human Sexual Behavior.
5. Lesson Plan 50-410-233: Development in Childhood.
6. Lesson Plan 50-410-237: Development in Adolescence.
7. Lesson Plan 50-410-239: Development in Adulthood.
8. Lesson Plan 50-410-402: Group Dynamics.
9. Lesson Plan 50-240-409: The Spectrum of Mental Health and Mental Illness.
10. Lesson Plan 50-400-607: Personality Disorders.
11. Lesson Plan 50-340-651: Transient Situational Disturbance.
12. Lesson Plan 50-400-621: Psychosis I.
13. Lesson Plan 50-400-605: Psychotic Disorders II.
14. Lesson Plan 50-440-522: Suicidology.
15. Lesson Plan 50-240-550: Introduction to Psychological Testing.
16. Lesson Plan 50-410-406: Introduction to the Wechsler Adult Intelligence Scale.
17. Lesson Plan 50-410-501: Techniques of Observation (and corresponding mimeograph sheets).

Lesson Plans:

18. Lesson Plan 50-410-606: Introduction to the Minnesota Multiphasic Personality Inventory.

19. Lesson Plan 50-410-612: Administration of the Wechsler Adult Intelligence Scale, Practical Exercise.

20. Lesson Plan 50-410-613: WAIS AND MMPI Scoring Exercise

21. Lesson Plan 50-440-321: Introduction to Interviewing (and corresponding mimeographed materials).

22. Lesson Plan 50-440-607: Principles of Recording.

23. Lesson Plan 50-440-608: Basic Interviewing Skills.

24. Lesson Plan 50-440-609: Orientation to Interviewing.

25. Lesson Plan 50-410-614: Learning Principles/Behavior Modification.

26. Lesson Plan 50-440-518: Crisis Intervention.

27. Lesson Plan 50-440-517: Orientation to Medical Social Work.

28. Lesson Plan 50-240-507: Social/Psychological Aspects of Drug Abuse.

29. Lesson Plan 50-240-511: Altered States of Consciousness.

30. Lesson Plan 50-240-513: Drug and Alcohol Treatment Programs.

31. Lesson Plan 50-240-551: Pharmacology of Drugs of Abuse.

Reference and Technical Manuals:

32. General Reference 50-240-514-1: Science Specialist Course Student Handbook

33. General Reference 50-240-490-1: Introduction to Psychopathology.

34. General Reference 50-240-490: Glossary of Selected Terms

Workbooks and Study Guides:

35. Mimeo 50-340-501-1: Psychiatric Specialist Course Student Handbook.

36. Student Text 8-246: Behavioral Science Specialist

Programmed Instruction:

37. Programmed Instruction 50-240-409-1: Illusions, Hallucinations and Delusions.

38. Programmed Instruction 50-410-230-1: Ego Defense Mechanisms.

Mimeographed Materials:

39. Mimeograph 50-240-506, Chemotherapy.

COURSE BIBLIOGRAPHY
of

COURSE: (2) Cardiopulmonary Laboratory Specialist 3ALR91630

SOURCE: Sheppard Air Force Base, Texas U.S. Air Force

Program or Plan of Instruction:

1. Plan of Instruction PLI 3ALR91630, Cardiopulmonary Laboratory Specialist. 27 September 1978.

Lesson Plans:

None

Reference and Technical Manuals:

2. Technical Pamphlet 2TPT-511101, Basic Mathematics-Fractions. April 1967.

3. Technical Pamphlet 2TPT-511103, Basic Mathematics-Algebra Equations. April 1967.

4. Technical Pamphlet 2TPT-511105, Basic Mathematics-Percentages. May 1967.

5. Technical Pamphlet 2TPT-511106, Basic Mathematics-Powers of Ten. May 1967.

6. Technical Pamphlet 2TPT-511107, Basic Mathematics-Algebraic Expressions. July 1973.

7. Technical Pamphlet 2TPT-512002, Elements of Physics-Matter. April 1967.

8. Technical Pamphlet 2TPT-512003, Basic Physics-Matter. April 1967.

Workbooks and Study Guides:

9. Study Guide II-3A, Respiratory Anatomy and Physiology. January 1978.

10. Study Guide I-54, Cardiovascular Dysfunction. December 1977.

11. Study Guide II-1, Gas Laws. June 1978.

Programmed Instruction:

12. Specialty Training Standard STS916X0, Cardiopulmonary Laboratory Specialist and Cardiopulmonary Laboratory Technician. August 1978.

13. Study Skills 52-11. June 1973.

Mimeographed Materials:

14. Handout I-1, Orientation. July 1978.
15. Handout I-3b, Common Logarithms. June 1978.
16. Handout I-5, Cardiology Glossary. June 1978.
17. Handout I-5c, Anatomy and Function of the Heart. June 1978.
18. Handout I-5d, Muscular System. December 1977.
19. Handout I-5e, Hemodynamics. June 1978.
20. Handout II-3, Pulmonary Glossary. June 1978.
21. Handout II-3b, Parameters of Respiration and Ventilation. December 1977.
22. Handout II-5, Acid Base Balance. June 1978.
23. Handout II-6b, Systolic Time Intervals. July 1978.
24. Handout I-7a, Einthovens Triangle. June 1978.
25. Handout I-8c, Electrocardiogram Intervals. June 1978.

COURSE BIBLIOGRAPHY
of

COURSE: (3) Clinical Specialist (Primary Technical) 300-91C20

SOURCE: Fort Sam Houston, Texas U.S. Army

Program or Plan of Instruction:

1. Program of Instruction for 300-91C20, Clinical Specialist (Primary Technical) Course, MOS: 91C20. 2 June 1977.

Lesson Plans:

2. LP-65-530-005 - Course Directors' Orientation.
3. LP-65-530-006 - Effective Learning and Communication Techniques.
4. LP-65-530-007 - Ethical and Medicolegal Responsibilities of the Clinical Specialist 91C20/AMEDD Team.
5. LP-65-530-008 - Enlisted MOS Structure and Duties and Organization of the Department of Nursing.
6. LP-65-530-009 - The Hospital Chart and Medical Records.
7. LP-65-530-010 - Temperature, Pulse, Respirations and Blood Pressure.
8. LP-65-530-011 - Signs and Symptoms.
9. LP-65-530-012 - Hygienic, Safety and Activity Needs of the Surgical Patient.
10. LP-65-530-013 - Asepsis.
11. LP-65-530-014 - Pre and Postoperative Care of the Surgical Patient.
12. LP-65-530-016 - Simple Disorders of the Skin.
13. LP-65-530-017 - Common Nursing and Diagnostic Procedures in Digestive Disorders.
14. LP-65-530-018 - Nursing Procedures for Respiratory Conditions.
15. LP-65-530-019 - Nursing Procedures in Disorders of the Bowel.
16. LP-65-530-020 - Death and Dying.
17. LP-65-530-021 - Postmortem Care.
18. LP-65-530-022 - Conduct of Sick Call.

19. LP-65-530-023 - Assisting with the Physical Examination.

20. LP-65-530-024 - Collection and Storage of Specimens.

21. LP-65-530-025 - Simple EENT Conditions (Eye, Ear, Nose, Throat).

22. LP-65-530-026 - Cardiopulmonary Resuscitation.

23. LP-65-530-027 - Alaphylactic Shock.

24. LP-65-530-028 - Administering Immunizations.

Reference and Technical Manuals:
None

Workbooks and Study Guides:
None

Programmed Instruction:
None

Mimeographed Materials:
None

COURSE BIBLIOGRAPHY
of

COURSE: (4) Dialysis Technician Course 300-F2

SOURCE: Fort Sam Houston, Texas U.S. Army

Program or Plan of Instruction:

1. Program of Instruction for 300-F2, Dialysis Technician Course, MOS: none, ASI: M3. September 1977.

Lesson Plans:

None

Reference and Technical Manuals:

None

Workbooks and Study Guides:

None

Programmed Instructions:

None

Mimeographed Materials:

None

COURSE BIBLIOGRAPHY
of

COURSE: (5) Hospital Food Service Specialist 800-94F20

SOURCE: Fort Sam Houston, Texas U.S. Army

Program or Plan of Instruction:

1. Program of Instruction for 800-94F20, Hospital Food Service Specialist, MOS: 94F20. 18 June 1975.

Lesson Plans:

None

Reference and Technical Manuals:

None

Workbooks and Study Guides:

None

Programmed Instruction:

None

Mimeographed Materials:

None

APPENDIX E (continued)

COURSE BIBLIOGRAPHY
of

COURSE: (6) Medical Laboratory Procedures (Advanced) 311-92B30

SOURCE: Fort Sam Houston, Texas U.S. Army

Program or Plan of Instruction:
Program of Instruction for 311-92B30, Medical Laboratory Procedures (Advanced) 311-92B30, MOS: 92B30. 2 June 1975.

Lesson Plans:

1. LP-09-280-213, Instrumentation.
2. LP 09-280-213-18, Fluorometer Operating Instructions.
3. LP 09-280-213-27, Measurement of Calcium by Fenorometric Titration.
4. LP 09-280-213-11, Serum Protein Electroploresis (Beckman Microzone).
5. LP 09-280-213-22, Gilford Model 300 M Spectrophotometer.
6. LP 09-280-213-23, Blood Gas Analyzer.
7. LP 09-280-213-20, Freezing Point Osmometry (Advanced Model 3D).
8. LP 09-280-213-21, Guilford Computer Directed Analyser.
9. LP 09-280-213-5, Introduction to Gas Chromatography.
10. LP 09-280-213-12, Zip Zone Lipoprotein Electrophoreis.
11. LP 09-280-215, Separation and Concentration Techniques.
12. LP 09-280-217-(1), Principles of Colorimetry and Photometry.
13. LP 09-280-219-(1, 2), Components and Function of Photometry.
14. LP 09-280-221-(3, 5a, 6a), Solutions.
15. LP 09-280-223-(1,2,3,4), Photometric Calibrations and Spectral Absorbancy Curves.

Lesson Plans:

16. LP 09-280-225-(1), Organic Chemistry.
17. LP 09-280-227-(1,2,3), Quality Control.
18. LP 09-280-229, Collection, Preservation and Shipment of Specimens.
19. LP 09-280-235-(1), Carbohydrates.
20. LP 09-280-237-(1), Glucose and Glucose Tolerance Test.
21. LP 09-280-239-(1,2), Serum Proteins and Their Fractions.
22. LP 09-280-241-(1,2), Fibrinogen.
23. LP 09-280-243-(1), Protein is Cerchrospinal Fluid.
24. LP 09-280-245, Immunoglobulins.
25. LP 09-280-247, Thin Lager Chromatography.
26. LP 09-280-249-(1,4), Protein Electrophoresis.
27. LP 09-280-251-(1), Hemoglobin and Haproglobin.
28. LP 09-280-253, Acid Base Balance.
29. LP 09-280-255-(1,3), Serum Chloride and Carbon Dioxide.
30. LP 09-280-257-(1), The Chloridometer.
31. LP 09-280-259, Eldocrene and Aldosterene and ADH.
32. LP 09-280-261-(1), Calcium.
33. LP 09-280-263-(1,2), Magnesium.
34. LP 09-280-203-(1,2,3,4), The Auto Analyser.
35. LP 09-280-205-(1), Balances.
36. LP 09-280-207-(1,2,3,4), Review of Mathmetics.
37. LP 09-280-209-(1), Volumetric Glassware.
38. LP 09-280-211-(1,2,3,5), General Chemistry Review.
39. LP 09-280-265, Sodium and Potassium.
40. LP 09-280-267, Flamephotometry.

Lesson Plans:

41. LP 09-280-269, Osmolality.
42. LP 09-280-271, PH and Blood Gas Electrodes.
43. LP 09-280-273, Phosphorus.
44. LP 09-280-275, Endocrene: PTH and PT Reabsorption.
45. LP 09-280-277, Iron and Iron Binding Capacity.
46. LP 09-280-279, Atomic Absorption.
47. LP 09-280-285, Introduction to Enzymes.
48. LP 09-280-285-(1), Introduction to Enzymes.
49. LP 09-280-287, Cardiac Enzymes.
50. LP 09-280-289, Lactic Dehydrogenase.
51. LP 09-280-291, Creatine Phosphokinase.
52. LP 09-280-293-(1,2), Transaminases, SGOT and SGPT.
53. LP 09-280-295-(1,2,3,4), Lipids and Triglycerides.
54. LP 09-280-297-(1), Cardiac Glycosides.
55. LP 09-280-299-(1), Digestion.
56. LP 09-280-301-(1,2,3), Amylase.
57. LP 09-280-303-(1,2), Lipasis.
58. LP 09-280-305-(1,2), Gastric Analysis.
59. LP 09-280-307-(1), Vitamin B12.
60. LP 09-280-309-(1), Carotenes.
61. LP 09-280-313-(1), Liver Enzymes
62. LP 09-280-315-(1,2), Phosphorases.
63. LP 09-280-317-(1), Cholinesterase.
64. LP 09-280-319-(1), Gamma Glutamyl Transpeptidase, gGY.
65. LP 09-280-321-(1,2), Cholesterol.

Lesson Plans:

66. LP 09-280-323-(1,2), Bilirubin.

67. LP 09-280-325-(1,2), Bromsulfopnthalein.

68. LP 09-280-327-(1), Blood Ammonia.

69. LP 09-280-329-(1), Amniotic Fluid.

70. LP 09-280-331-(1), Lecithin Sphingomyelin Ratio.

71. LP 09-280-337-(1,2,3), Physical and Chemical Examination of Urine.

72. LP 09-280-339-(1,2), Urinalysis and Microscopic Examination of Strain Urinary Sediments.

73. LP 09-280-341-(1,2), Creatinine and Creatinine Clearance.

74. LP 09-280-343-(2,3), Urinary Protein.

75. LP 09-280-345-(1,2), Urinary Calculi.

76. LP 09-280-347-(1,2), Phenolsulforphthalein (PSP).

77. LP 09-280-349-(1,2), Uric Acid.

78. LP 09-280-351-(1), Porphyrins and Urobilinogen.

79. LP 09-280-353-(1), Phenylketonuria.

80. LP 09-280-355-(1,2), Urea Nitrogen. BUN.

81. LP 09-280-357-(1,2), Radioassay.

82. LP 09-280-359-(1), Pituitary Hormones.

83. LP 09-280-361-(1), Adrenal Medullary Hormones.

84. LP 09-280-363-(1), Catecholamines and VMA.

85. LP 09-280-365-(1,2), Ketosteroids (Estrogens).

86. LP 09-280-367-(1), Thyroid Hormones.

87. LP 09-280-369-(1), Thyroxine and Triodothyronine, T-4 and T-3.

88. LP 09-280-371-(1), Adrenal Cortex Hormones.

89. LP 09-280-373-(1), Endocrine Reproductive Hormones.

90. LP 09-280-375-(1), Cortizol, 17-OH Steroids, 17 Ketogenics.

Lesson Plans:

91. LP 09-280-377-(1), Introduction to Toxicology.

92. LP 09-280-379-(1), Classifications of Poisons.

93. LP 09-280-381, Medicine Legal Aspects of Toxicology.

94. LP 09-280-383-(1,2), Heavy Metals.

95. LP 09-280-385-(1,2,3), Toxicology Alcohols.

96. LP 09-280-387, Gas Chromatography.

97. LP 09-280-389-(1,2), Salicylates.

98. LP 09-280-391-(1,2), Bromides.

99. LP 09-280-393, Abused Drugs.

100. LP 09-280-861-(1,2), Introduction to Diagnostic Cytology.

101. LP 09-280-862-(1,2), Processing of Cytology Specimens.

102. LP 09-280-863-(1), Anatomy and Physiology of the Uterine Cervix and Adenexa.

103. LP 09-280-865-(1,2), Benign Smear Patterns.

104. LP 09-280-801-(1,3,4,5,6,7,8), Introduction to Immunology.

105. LP 09-280-804-(1,2,3,4), Agglutination Tests for Febrile Diseases.

106. LP 09-280-809-(1), Tests for Antistreptolysin "O".

107. LP 09-280-812-(1), Tests for Rheumatoid Arthritis and Creative Protein.

108. LP 09-280-815-(1), Serological Tests for Syphilis.

109. LP 09-280-818-(1,2), Cardiolipin Microflocculation Test for Syphilis.

110. LP 09-280-820-(1), RPR Card Test for Syphilis.

111. LP 09-280-821, Complement Fixation Test.

112. LP 09-280-824-(1,2,3,4,5), Fluorescent Antibody Techniques.

Lesson Plans:

113. LP 09-280-825, Serological Tests for Syphilis.

114. LP 09-280-000-2, Hematology Objectives.

115. LP 09-280-006, Hematological Procedures.

116. LP 09-280-007-(1,2,3), Collection of Blood Samples and Cell Enumeration.

117. LP 09-280-009, Hemoglobin.

118. LP 09-280-011-(1), Erthrocyte Indices.

119. LP 09-280-021-(1), Special Counts.

120. LP 09-280-023-(2), Spinal Fluid Cell Count and Differential.

121. LP 09-280-028-(1), Special Preparations.

122. LP 09-280-046-(1), Hemoglobinopathies.

123. LP 09-280-047-(1), The Anemias.

124. LP 09-280-048, The Leukemias.

125. LP 09-280-032, Special Stains-Alkaline Phosphatase Peroxidase, Hemogiderin.

126. LP 09-280-060, Introduction to Hemostasis and Blood Coagulation.

127. LP 09-280-062, Blood Coagulation.

128. LP 09-280-063, Anticoagulant Therapy.

129. LP 09-280-064, Blood Coagulation (Phase 3).

130. LP 09-280-065, Disseminated Intravescular Coagulation.

131. LP 09-280-065, Blood Coagulation Phase IV.

132. LP 09-280-066, Assessment of Hemostatic Function.

133. LP 09-280-068, Hemorrhagic Disorders.

134. LP 09-280-013, Graded Practical Examination.

135. LP 09-280-601, Orientation to Parasitology.

Lesson Plans:

136. LP 09-280-601, Parasitology.

137. LP 09-280-602, Introduction to Parasitology.

138. LP 09-280-603, Phylum Protozoa.

139. LP 09-280-604, Phylum Platghelminthes.

140. LP 09-280-605, Phyla Acasthoceplala and Hematoda.

141. LP 09-280-000-(1), Immunohematology Objectives.

142. LP 09-280-100-(2), Introduction to Immunohematology.

143. LP 09-280-101, Glossary of Terms.

144. LP 09-280-102, Blood Donor Processing.

145. LP 09-280-103, Effect of Washing on Antihuman Globulin (Coombs) Test.

146. LP 09-280-104, Hematology-ABO Blood Group System.

147. LP 09-280-105, Rh-Hn Blood Group System.

148. LP 09-280-106, Immunohematological Techniques.

149. LP 09-280-108, Orlu Blood Groups and Antibody Identification.

150. LP 09-280-109, Compatibility Testing.

151. LP 09-280-113, Enzymes, Absorption and Elation.

152. LP 09-280-120, Hemolytic Disease of the Newborn.

153. LP 09-280-123, Hepatitis Associated Antigen.

154. LP 09-280-450-(1,2,3) Laboratory Rules.

155. LP 09-280-451, History of Bacteriology.

156. LP 09-280-452, Host-Parasite Relationship.

157. LP 09-280-453-(1), Descriptive Terms.

158. LP 09-280-454-(1), Nutrition and Cultivation of Bacteria.

159. LP 09-280-456-(1), Media and Reagents.

160. LP 09-280-457-(1), Sterilization and Decontamination Procedures.