UNIVERSITY OF MICHIGAN SCUBA DIVING INSTRUCTOR'S GUIDE: CONFINED WATER TRAINING

by

Lee H. Somers

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Lee H. Somers, Ph.D.

Associate Research Scientist
Department of Atmospheric and Oceanic Science
Department of Physical Education
University of Michigan

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UNIVERSITY OF MICHIGAN SCUBA DIVING INSTRUCTOR'S GUIDE: CONFINED WATER TRAINING

INTRODUCTION

This technical report has been prepared for the use of scientific/educational diving instructors, assistant instructors, and instructor trainees. The content is based on course procedures, recommendations and requirements of the National Association of Underwater Instructors (NAUI), Professional Association of Diving Instructors (PADI), and/or the National YMCA Scuba Program in conjunction with research, program development, and experience of the author and University of MIchigan instructors. It includes information essential for the development of the instructor's knowledge, performance, and personal judgement in teaching scientific/ educational diving programs.

DESIGN OF A DIVING COURSE

A diving course consists of three basic elements - the classroom lecture, the pool skills training, and introductive openwater training. The classroom lectures, pool, and openwater training each consist of individual units. Each unit should be in outline format providing the following information:

- Unit objectives. This section gives the desired accomplishments and/or learning outcome for the student.

- Equipment and materials. This subheading refers to the necessary equipment and supportive aids required to conduct the particular class. Additional items may be deemed necessary by individual instructors. In some cases items that each student must have, either personally owned or provided by the University, are included.

- Outline of instruction. This is the primary portion of the unit outline. The instructional unit is outlined in progressive sequence in a topical fashion. Generally the outline will include an introductive review and motivation section. Naturally each instructor will wish to develop these areas to meet his/her own specific needs. The sequence should be a logical progression.

- Text references. This section gives the text pages or sections on which supportive reference material may be found in three different texts. The texts are selected to use with various instructional levels from recreational to scientifically oriented students. In some cases, where the material is not covered in a specific text, a periodical reference is included. The references are necessary for trainees and helpful to instructors in preparing for various lessons.

The format of a teaching outline or outline of instruction should consist of two facing pages or other arrangements to allow for instructor's notes. If two facing pages are used:

- the first page, located to the right or odd numbered page, is an outline of key information, and

- the second page, located to the left or even numbered page, is to be used as the instructor finds necessary to benefit or improve his delivery. He might use it for additional notes, presentation procedures, timing, visual and coordination, references, etc.

Each unit should have an estimated time frame. The length of each unit may vary, depending upon many factors: the subject to be covered, size of class, number of instruc-

tors, skills involved, equipment and aids available, instructors' and students' backgrounds, and capabilities. The duration of each unit will ultimately be determined when the students have mastered the subject matter and have attained skill proficiency.

Water session outlines may be very detailed and quite long. Such outlines are not designed to be used as a pool side teaching outline. It is a relatively comprehensive guide for novice instructors, instructor trainees, and assistants. The user will most benefit from study of the material prior to actually teaching the session. Each instructor should prepare a condensed version of the outline for each water session to guide him/her in teaching. These condensed outlines may be placed on file cards and laminated in plastic. The cards may be carried in a jacket pocket, around the neck on a lanyard, or on a clipboard.

On the other hand, the lecture outlines are designed to be used as direct, comprehensive guides during actual lecturing. The lecturer may use the blank page for additional personal notes and keying visual aids.

An instructor's course handbook should be in a loose-leaf form. Some individuals prefer to use a ring binder and separate each lesson or unit with tabbed indexing pages. Others prefer to include each lesson or unit in a separate file folder. The latter method has the advantage of reducing the loss or misplacing potential of all of your notes since

only one file folder is carried to the classroom at a time. The file folders may be safely stored at home in a file cabinet or box. I personally recommend that instructors maintain duplicate copies of lecture and water session outlines. The permanent copy may be maintained in a ring binder and the working copy in file folders.

COMPLIANCE WITH NATIONAL STANDARDS

Standards for instruction and course content in basic skin and scuba diving are currently in a state of flux. The diving community is essentially a "self-policing" community. However, the "apparent" relatively high incidence of mortality in certain areas of the United States among recreational scuba divers in 1974 and adverse public reaction resulted in governmental legislative action in Los Angeles County, California. This action imposed a number of specific standards for teaching, diver and instructor certification, diving, and charter boat operation. The diving community appealed the legislative action and the sponsors of the legislation soon realized that the new laws were "unworkable" and, in many cases, detrimental to the sport and community. Most of the Los Angeles Ordinance has been repealed.

An outgrowth of the "legislation panic" has been an "attempt to clean up its act" on behalf of the diving community. This factor, combined with conditions and warranties imposed by those companies that write instructor liability insurance have imposed a number of instruction,

course content and procedural "standards" on the instructor of skin and scuba diving. Failure to comply with these "standards" places the instructor and agency in an extremely vulnerable position relative to liability suits, subject to suspension by national certifying agencies (in other words, loss of teaching credentials), and loss of liability insurance coverage.

Each nationally recognized agency specifies minimum requirements relative to course duration, content, student to instructor ratio, skill performances, etc. In addition the National Scuba Training Council, the American National Standards Institute (Z-86 Committee), Los Angeles County (local only), and the American Alliance for Health, Physical Education and Recreation all have published "standards" for scuba diving instruction. With the exception of Los Angeles County, all of these standards were "recommended standards." The existence of so many standards has led to a state of confusion. For example, the Professional Association of Diving Instructors (PADI) required that each student must practice emergency ascents in openwater. To the contrary, the YMCA leaves such practices to the discretion of the instructor at many times. The instructor must be aware of the various standards for all agencies. Most instructors attempt to comply with "all existing standards" as a matter of self protection in the event of a law suit. This is possible with a few exceptions. Generally, it is most desirable for an instructor to first comply with those

standards specified by one major certifying agency (by which he is certified) and the associated insurance company. Then where reasonable develop further or refine his course content and performance requirements to also comply with the other agencies. Although this is not completely necessary, it does add one more dimension to the self-protection phenomena relative to law suits.

The scientific/educational diving community does not, at this time, have specific, universally recognized training standards. Some universities and agencies do stipulate certain minimum training standards and level of skill performance; see Michigan Sea Grant Program Technical Report No. 59 for additional information. Most instructors of basic scuba diving use the standards of the recreational diving community as a minimum standard for scientific/ educational scuba diving instruction.

The University of Michigan's program has been developed to comply specifically with the minimum standards specified by the National Association of Underwater Instructors (NAUI). These standards are stated in detail in NAUI Instructor Handbook. The NAUI general standards for diving courses are as follows (as issued in July 1977).

1. These NAUI course standards are the minimum which the NAUI Instructor is to meet or exceed.

2. Standards need to be realistic and enforceable. Enforcement is conducted through the sending of a student questionnaire to every student registered by a NAUI instructor. Returned questionnaires are administratively reviewed by Branch Managers. Problems are handled by the Board of Directors, with the aid of Branch Ethics Committees.

3. Exact curriculum content, difficulty of skills, course fees and length of class sessions will need to be keyed to the class size and location, plus the age and ability of the students.

4. The certifying instructor is not required to teach all course subjects, but is to be in control of all activities. The certifying instructor is responsible to assure that all required standards are met for certification. When outside speakers are used, they are to be given an outline of what is to be covered in their subject area. Be careful that the lecturer understands diving and can relate to divers.

5. Several NAUI instructors may work together and team teach a course. A NAUI instructor is to be present during all the activities of a NAUI course.

6. Waivers to deviate from the standards are to be requested in writing, well in advance of the time the variance will occur. This request is made to the Board of Directors via the Branch Manager or Headquarters. Waivers will only be granted when appropriate justification is submitted and the waived requirements will not jeopardize the safety of the students in the course.

7. Courses are to expose students to the current knowledge and skills of sport diving. Course outlines and textbooks recommended or provided by NAUI are to be used as guides. The instructor is to use applications, medical history/exam forms, statements of understanding, written examinations, textbooks, handouts, training aids, skill check lists, and releases or waivers as needed or required. Some aspects of required curriculum subject matter can be well covered with informational handouts.

8. The minimum age for each type of certification is to be reached by the closing date of the course.

9. To be certified as a NAUI diver, the student must be registered with NAUI Headquarters.

10. Some form of evaluating both skills and knowledge is to be used in each course. Required water skills are listed in each course standard. Knowledge tests may be oral or written, open or closed book, in class or at home.

11. No instructor shall provide instruction to a minor without first having secured a release signed by parent(s) and/or legal guardian(s).

12. The instructor shall require each student to complete a medical history and waiver or statement of understanding at the beginning of training. If the medical history form or the appearance of the student indicates any condition contrary to safe participation in diving activities, the student shall be required to secure medical approval by a licensed physician based on a diving medical examination prior to any further water training. The medical history forms and waivers of minors are to be signed by parent(s) and/or legal guardian(s).

13. In no event will medical approval be accepted wherein the physician signing the certificate is the student.

14. Records used for the purpose of recording the student's progress shall be maintained.

15. Records of knowledge tests for the purpose of evaluating the student's understanding of the instructional material shall be maintained.

16. All records relating to individual students shall be maintained for a minimum of five (5) years.

17. If a NAUI instructor becomes aware of any act, error or omission which might reasonably be expected to be the basis of a claim or suit, written notice shall be given NAUI Headquarters as soon as practicable, together with the fullest information obtainable. If claim is made or suit is brought, the instructor shall immediately forward to NAUI Headquarters every demand, notice, summons or other process received.

18. The NAUI Instructor who certifies a diver is to assure that the diver has had the supervised open water diving experience as required by the particular course standard. Open water dives are to include the use of the skills and equipment taught and appropriate to the type of certification. If the certifying instructor cannot conduct a particular open water dive, the instructor is obligated to make arrangements for another currently active NAUI instructor to conduct that open water dive.

19. Open water is a body of water considerably larger than a swimming pool with appropriate water conditions to offer a realistic and safe diving experience.

20. No open water instruction and/or tests shall be conducted without the use of a safety aid boat, raft or surface support station.

21. During open water instruction and/or tests, no instructor shall knowingly permit any student to leave the immediate area without supervision and attendance of an instructor or a certified assistant.

22. The use of protective suits, weight belts, personal flotation vests and surface floats with flag are recommended whenever they will enhance the learning of the required skills, increase student safety and enjoyment while being appropriate and practical for the location of the course.

23. The instructor is to give complete coverage of diving equipment in an objective and functional manner. A discussion of the features and principles of equipment, while using various different brands or models as examples, is appropriate. Advantages and disadvantages should be pointed out so the student can intelligently select and use the equipment.

24. The use of submersible pressure gauges and/or reserve warning devices are required for all open water scuba training. The use of submersible gauges for all scuba diving is strongly recommended.

25. Inflatable buoyancy control devices are required for all open water scuba training.

26. The maximum enjoyable activities which will help prepare students for open water diving are to be developed and used by the instructor. Examples would include underwater problem solving, games, drills, races, and other similar exercises.

27. To be certified as a NAUI diver of any level, the student is required to be able to find and rescue a non-breathing buddy of equal size, using the open water diving equipment appropriate for the course.

28. All NAUI diving courses are to make students aware of Cardio Pulmonary Resuscitation and encourage them to take formal training. All NAUI instructors are to teach opening the air way and mouth-to-mouth resuscitation. Only qualified CPR instructors may teach CPR. Cardio Pulmonary Resuscitation training is in addition to the required minimum course hours.

29. All NAUI scuba diving courses are to include information on the importance and procedures for logging dives, with students actually using log books.

30. The minimum number of course hours is specified for each course. The achievement of the student during the course is the most important and useful key to safe participation in diving. Therefore, the instructor is to use whatever number of hours above the required minimum that are needed to assure a particular student or class achieves the ability to be safe divers. If additional or more detailed coverage of subjects or skills is given, or the class size is increased by the use of assistants, then the course hours are to exceed the minimum.

31. All hours actually spent in diving instruction are counted in the appropriate category (classroom/lecture, pool or open water) and in the total course hours. Time actually in the water is counted as pool or open water time as appropriate and the time on the pool deck, shore, or boat is classroom/lecture time only if diving instruction is being conducted. Time used in travel, changing clothes, preparation, eating, etc. may not be counted in the number of hours of diving instruction.

32. The maximum allowed student to instructor ratio is 10 to 1 during water work unless a lower ratio is stated for a particular diving activity. Assistant instructors may be used. A NAUI instructor is to be present and in control of the class at all times. The order of preference for the use of Assistant Instructors is: another NAUI instructor, a certified Underwater Instructor of another organization, a certified Assistant Instructor, a certified Divemaster, a certified Skin Diving Leader. No others may qualify as assistants to satisfy the required ratio. Advanced or experienced divers under the supervision of the instructor may be used as safety divers or helpers, but not counted in the required ratio. Skin Diving Leaders may assist with scuba diving activities if they are scuba certified; if not scuba certified they may only help with skin diving activities.

33. For pool training only, divers in training to be Assistant Instructors, may be counted toward the student to instructor ratio.

34. The maximum allowable student to instructor ratio of 10 to 1 applies to all water work: pool, confined water and open water. This ratio is to be used under ideal conditions and should be decreased whenever water conditions, diving activities or student needs dictate. This will require a value judgement on the part of the instructor based on a safe, enjoyable experience for the students.

The terms Scuba Diver, Basic Scuba Diver and Qualified Scuba Diver are used interchangeably in the NAUI standards and on NAUI materials. They refer to the same certification course. The NAUI Basic Scuba Diving Course Standards are:

1. Minimum age for certification is 16.

2. Minimum course duration is 27 hours. Of this time, 16 hours or more are to be in-water activities, and the remainder is to be spent in classroom/lecture activities. Of the time spent in water activities, at least 2 hours are to be in open water; the balance of the water time may be in open water or pool. Of the open water time at least 45 minutes is to be underwater on Scuba.

3. The Basic Scuba Course is a combined skin and scuba diving course. Therefore, skin diving is to be taught where it will best enhance the total learning outcome of the course.

4. A minimum of three (3) open water dives are required. One of these is to be a skin dive and two (2) are to be scuba dives. At least one (1) of these open water training experiences is to take place to a depth of 20 feet. Exposures in excess of 40 feet are not recommended. Open water training is to be conducted on more than one day. It is recommended that training dives be spread throughout the course wherever possible.

5. The required curriculum subject areas which are to be covered in a Basic Scuba Course are:

   a) Applied Sciences

      This area is to provide the student with a basic knowledge of physics, physiology, and medical aspects as they relate to a diver's performance in the water. Emphasis is to be placed on the diver's physical fitness, diving hazards, personal limitations and the behavioral changes needed to function safely as a diver. Material is to be presented in a manner which is of practical appli cation to the sport and is to specifically include: gases, pressure, volume, temperature, density, buoyancy, vision and acoustics; the definition, cause, symptoms, signs, first aid, treatment, and prevention of decompression sickness, nitrogen narcosis, respiratory accidents, squeezes, overexertion and cverexposure, air embolism and related injuries. Decompression tables are to

be covered to the extent required for the students to be able to safely calculate repetitive no decompression dives.

b) Diving Equipment

This area is to provide the student with a basic knowledge of the purpose, features, types and use of sport skin and scuba diving equipment. The student is to be prepared to intelligently select, use and care for the following: mask, snorkel, fins, surface float with flag, personal flotation vest, knife, weight belt, protective suit, depth gauge, watch, pressure gauge, compass, regulator and cylinder including valve and harness or backpack, plus any other useful accessories.

c) Diving Safety

This area is to provide the student with a basic knowledge of lifesaving and first aid as applied to diving. Underwater communications, underwater orientation, dive planning and safety rules are also to be covered. Shock, wounds, and drowning are to be covered under first aid. Lifesaving is to include rescues, tows, and artificial respiration as they apply to open water.

d) Diving Environment

This area is to provide the student with a basic knowledge of the physical and biological aspects of the environment in the area where the course is conducted. The fundamentals of conservation, regulations, dangers, water movement and water characteristics, including the environment's effect on the diver, are to be covered.

e) Diving Activities

This area is to provide the student with a basic knowledge of the who, when, where, what and why of diving. Specific references to dive clubs, dive boats, dive stores, diving locations, diving books magazines, plus related courses are to be included. A limited introduction to specific diving activities should be given.

6. The required water skills which are to be covered <u>during</u> the pool or confined water training of a Basic Course are:

a) Swimming Skills (No Equipment)

1) Distance swim of 220 yards, nonstop any stroke.

2) Survival swim for 10 minutes, treading, bobbing, floating, drownproofing, etc.

3) Underwater swim of 20 yards.

b) Skin Diving Skills (Mask, Snorkel, Fins)

1) Distnace swim of 440 yards, nonstop, using no hands.

2) Complete resuce of another diver in deep water.

3) Practice and perform without stress, proper techniques including: water entries/exits, surface dives, swimming with fins, clearing the snorkel, ditching the weight belt, buoyancy control with the personal flotation vest, underwater swimming and surfacing.

c) Scuba Diving Skills (Skin and Scuba Equipment)

1) Repeat all listed skin diving skills while using scuba.

2) Tow another fully equipped scuba diver 100 yards.

3) Practice and perform without stress, proper techniques including: mask and mouthpiece clearing, buddy breathing, emergency swimming ascents, alternating between snorkel and scuba.

7. The water skills for the pool may be done in confined or open water if appropriate. The skill performance objectives may be used in the pool or confined water and to replace all skills except the swimming skills. If the skill perfomrance objectives are used in the pool, they are then repeated in open water. This is a preferred procedure as it helps to prepare the student for the open water training.

8. Skill Performance Objectives.

The following skills are to be completed in open water wearing all equipment appropriate for the local diving conditions. Diving skill development may be in a swimming pool, but final diving skill performance is to be in open water. The student/diver is to be able to accomplish each of these skills without undue stress.

a) Skin Diving: Pre and Post Dive Skills

1) Don and adjust all skin diving equipment.

2) Check own equipment and equipment of buddy diver for proper donning, adjustment and function.

3) Walk and maintain balance while wearing fins.

4) Prevent mask from fogging while diving.

5) Rinse, clean and maintain all skin diving equipment.

b) Skin Diving: Surface Skills

1) Enter and exit the water using a variety of techniques typical of local conditions such as deep/shallow water, high/low entry points, rough/calm water, surf, boat, rocks, mud and weeds.

2) Determine buoyancy and make adjustments as needed to achieve neutral buoyancy.

3) Recognize surface signals for divers.

4) Completely inflate and deflate orally, personal inflatable vest or BC.

5) Rest by treading, vest use, snorkel breathing or other survival swimming techniques.

6) Breathe through snorkel with face submerged while resting and swimming.

7) Control airway with face submerged by breathing through water in the snorkel and avoid choking.

8) Swim with fins using two or more kicks and wearing at least mask, snorkel, fins and inflatable vest or BC.

9) Swim in and over weeds, kelp or other obstructions if representative of local diving.

10) Use the buddy system for skin diving by remaining within 10 feet of a buddy diver at the surface and constantly remaining near the approximate location of the buddy diver when the buddy is submerged.

11) Ditch the weight belt.

12) Remove, adjust, and replace mask, snorkel, fins and weight belt.

13) Assist a buddy diver by providing support, orally inflating buddy's inflatable vest and transporting with tow while maintaining close visual contact and using two different methods.

14) Remove equipment, including mask, snorkel and weight belt from another diver who is simulating unconsciousness.

15) Simulate resuscitating another diver.

16) Release a simulated leg cramp.

17) If appropriate for local conditions, enter the water with a float, flag and line and tow for a period of time.

c) Skin Diving: Underwater Skills

1) Descend beneath the surface using head first and feet first surface dives.

2) Equalize pressure in air spaces for expedient and comfortable descent and ascent.

3) Swim underwater.

4) Dive to a depth of 10 feet or more and surface with evidence to verify depth was attained.

5) Ascend to the surface at a moderate steady rate while looking up and around with one hand extended above the head.

6) Clear snorkel of water upon surfacing and resume breathing without removing the snorkel from the mouth.

7) Swim through weeds, kelp or other obstruction if representative of local diving.

8) Separately remove own and buddy's weight belt.

9) Bring a submerged diver simulating unconsciousness to the surface.

d) Scuba Diving: Pre and Post Dive Skills

1) Assemble, don, adjust, remove and diassemble scuba equipment.

2) Check own equipment and equipment of buddy diver for proper donning, adjustment and function.

3) Rinse, clean and maintain all scuba diving equipment.

4) Record all pertinent information in a diving log book.

e) Scuba Diving: Surface Skills

1) Enter and exit the water using a variety of techniques typical of local conditions such as deep/shallow water, high/low entry points, rough/calm water, surf, boat rocks, mud and weeds.

2) Swim, wearing at least mask, snorkel, fins, BC and scuba while using 2 or more kicks.

3) Recover from this swim, and continue by using survival swimming techniques to rest at the surface.

4) Alternate breathing from snorkel to regulator with face submerged without choking.

5) Remove and replace weight belt.

6) Perform as a buddy pair remaining within 10 feet of another scuba diver at the surface and underwater.

7) Swim in and over weeds, kelp or other obstructions if representative of local diving.

f) Scuba Diving: Underwater Skills

1) Descend with a minimum movement using a surface dive, breath control and BC to control rate of descent.

2) Equalize pressure in air spaces for expedient, comfortable and safe descents and ascents.

3) Control buoyancy by using a BC, breath control and weight adjustment to maintain a depth in mid-water without contact and with a minimum of movement.

4) Recognize and respond to standard underwater hand signals.

5) Repeatedly remove, replace and completely clear mask of water while breathing from scuba.

6) Repeatedly remove, replace and clear regulator of water using two methods.

7) Regain a regulator which has fallen behind the shoulder.

8) Buddy breathe with another diver. Be the donor of the air and the receiver of the air. To be performed in a stationary position.

9) Perform a slow controlled emergency swimming ascent with all equipment in place and in use while exhaling. This should be as near to a normal ascent as possible.

10) Breathe from scuba and swim underwater a total of at least 45 minutes during at least two dives.

11) Prevent exhaustion of air supply while scuba diving by using a gauge or reserve mechanism.

12) Dive in limited visibility if representative of the local diving.

13) Breathing normally with scuba ascend to the surface at a steady rate of 60 feet per minute while controlling expanding air in the BC.

14) Swim in and through weeds, kelp or other obstructions if representative of local diving.

The conditions and limitations specified by the NAUI liability insurance policy include:

1. No openwater instruction and/or tests shall be conducted without the use of a safety aid boat, raft, or surface support station.

2. During openwater instruction and/or tests, no instructor shall knowingly permit any student to leave the immediate area without supervision and attendance of an instructor or a certified assistant.

3. No instructor shall provide instruction to a minor without first having secured a release signed by both parents and/or legal gaurdians.

4. The instructor shall require each student to complete a medical history form and waiver at the beginning of the course. If the medical history form or the appearance of the student indicates any condition contrary to safe participation in diving activities, the student shall be required to secure medical approval by a licensed physician based on a diving medical examination prior to any further water training.

The medical history forms and waivers of minors are to be signed by both parents and/or legal guardians.

5. In no event will medical approval be accepted wherein the physician signing the certificate is the student.

6. Records used for the purpose of recording the student's progress shall be maintained.

7. Records of knowledge tests for the purpose of evaluating the student's understanding of the instructional material shall be maintained.

8. All records relative to individual students shall be maintained for a minimum of five (5) years.

Instructors must constantly read instructional agency newsletters and upgrade or modify their courses to remain abreast of new standards and trends in the diving community. It is likely that there will be more significant changes in the immediate future.

THE SCUBA DIVING INSTRUCTOR

The quality of training that a student has received is not a function of the agency card that he carries. Divers and instructors continuously debate the merits of NAUI versus PADI versus YMCA versus NASDS training. It is not the agency but the instructor that ultimately determines the quality of the training. There are good and bad instructors in each national program. Also, course duration is not a true measure of course quality. I frequently hear instructors boast about their 100 to 125 hour basic scuba diving courses. A good instructor can often produce a better diver in a 30 to 40 hour course than a bad instructor can in a 100 hour course. I could cite an almost endless list of examples; however, for the most part it all reduces down to one common denominator, the instructor. Let's examine some of the characteristics of a good instructor.

Desire

First the individual must have the inner desire to teach and work with others. Diving instructors must be willing to accept long hours, human problems, logistical problems, physical stress, psychological stress, and hard work. Frequently, the financial reward is relatively small in comparison to the task and responsibility. It takes a tremondous amount of desire and human understanding to be a good instructor.

Knowledge of Subject

Many non-diver educators and instructor trainess fail to recognize the high level academic and skill background and training that are required prerequisites for certification as a diving instructor. Knowledge of scuba diving is built on a solid foundation of study, training, practice, and experience. Being a skilled underwater swimmer is only a small portion of the instructor's qualifications. A good instructor must also be a skilled swimmer, lifesaver, and first aider. He must have a strong academic knowledge of basic physics, human physiology, first aid, oceanography, limnology, engineering aspects of equipment, stress psychology, and so on. The average diving instructor is far more knowledgeable in the area of hyperbaric physiology and medicine than the average practicing physician. Not only must the instructor be knowledgeable in these subjects but he must be capable of communicating that knowledge to a variety of students ranging from low intelligence high school drop outs to highly skilled and intelligent professional persons such as Ph.D. physicists, physicians and engineers. In his classroom the scuba instructor is the authority; he must know his subject. There is no room for "bluffing."

Physically Fit

To quote Dr. E.H. Lanphier, "One of the primary considerations is that diving involves heavy exertion. Even if

a man does not intend to engage in spearfishing or other activities that are obviously demanding, he will sooner or later find himself in situations which tax his strength and endurance." A diving instructor must not only have the strength and endurance to survive in an emergency himself, but also must insure the survival of his student. Consider that the emergency is most likely to occur on the last dive of the day when everyone is cold and fatigued. The instructor must rise to the occasion.

Of nearly equal importance is the fact that you, the diving instructor must set a good example for your students. Students read of the necessity of high level physical fitness in diving textbooks and listen to lectures on the merits of physical fitness. If they are being taught by a pot-bellied instructor who gasps for breath after swimming across the pool, what is the possibility of the development of a positive attitude toward and respect for physical fitness. Those instructors who advocate "buoyancy equipment substitutes" for basic physical fitness and watermanship are instilling a false sense of security in their students and doing the diving community a significant disservice. Remember you, the instructor, are the example that your students will seek to imitate. Furthermore, there is a definite relationship between mental alertness, absence of nervous tension and physical fitness.

As long as I am discussing the subjects of fitness and "example", what about smoking and the diving instructor? In one word, "DON'T!" If you do smoke now, "STOP!" It has been sufficiently demonstrated that smoking has adverse affects on general physical condition and the respiratory and circulatory systems. By this time diving instructors and trainees should be knowledgeable enough to equate the relationship between damaged lung tissue and diving. If you do smoke and you can't stop, I question whether you have the strength of character to be a good diving instructor. At least don't smoke in the presence of your students. Set a positive example!

Experience

Regarless of how high an instructor trainee performs on a theory test or how well he does in demonstrating diving skills in a swimming pool, the element of diving experience is a key factor in denoting the good instructor. Too often physical educators fail to recognize this factor. In physical education an instructor equipped with a book, a very basic skill ability, and a reasonable amount of teaching ability is often expected to "teach" nearly any basic sport or athletic skill. In many cases the instructor has absolutely no prior experience in that activity. This attitude or philosophy cannotbe allowed in the instruction of scuba diving. The diving community has long recognized the "experience factor." Generally, applicants for instructor certification must have at least one year of scuba diving

experience since completing basic scuba training including a minimum of 25 hours actual underwater diving time in "open water" (lake, ocean, etc.), not pools. The experience should include diving under a variety of environmental conditions and dives to at least 60 fsw depths. The applicant submits a "logbook" of diving experience; however, the experience or lack of experience is generally evaident to a board of examiners at the time of testing. The 25 hour figure is, in my opinion, low. Applicants with 50 to 100 hours of underwater diving time are generally more likely to be successful in their diving instructor training course and examinations for instructor certification.

The good instructor will acquire a wide variety of diving experiences. How can you really expect to teach about marine creatures, currents, tides, and thermoclines if you have never encountered them yourself? A good instructor will travel and continuously seek information and experience under all possible environmental conditions. He will attend workshops on cave diving, ice diving, surf entry, etc. Any person who intends to teach diving in the midwest, for example, must be experienced with the waters of Florida Keys, Bahamas, and/or Caribbean. Information on diving in these locations is a vital and necessary part of the basic scuba course. It is reasonable to assume that well over 50% of the students successfully completing basic scuba training in the midwest will experience diving in Florida, Bahama Islands, or Caribbean Sea within 3 years of completion of the course.

Acquisition of experience is more than simply diving in new geographic areas. The good instructor will develop a self-imposed program of continuing education. Diving instruction agencies sponsor a variety of workshops throughout the country each year. These include diving medicine seminars, scuba lifesaving workshops, ice diving clinics, diving equipment repair courses, film festivals, cardiopulmonary resuscitation courses, underwater photography courses, and many other relevant courses, workshops or clinics. In addition the good instructor will audit or seek staff positions at Instructor Training Courses. This is an excellent way to gain knowledge and experience.

Experience in teaching skin and scuba diving is also vital to the success of instructor certification applicants. Unfortunately, the Instructor Training Course does not include ample time for participants to gain enough supervised teaching experience during the course. A good instructor applicant will have gained teaching experience under the supervision of an instructor prior to attending an instructor training course and being examined for instructor certification. A logical progression following basic certification might include:

1. Sport, open water, and/or advanced scuba diving training.
2. CPR, first aid and lifesaving courses.
3. Serving as an instructor aide in basic scuba classes.
4. Skin diver leader and assistant instructor courses.

5. Assisting in several basic scuba courses including teaching both pool and theory classes (at least in part) under the direct supervision of a scuba instructor.

6. Self-testing or supervising instructor testing in skill and theory.

7. Physical conditioning (actually throughout entire program).

I cannot overstress the direct contact with students in supervised teaching situations. This might take the form of assisting a basic student with mask clearing or kick improvement and progress to actually teaching for an entire class period. I also stress the necessity of "observing" a good instructor teaching his/her class; much can be learned from simple, critical observation.

Under the topic of experience I am also including the minimum prerequisites for applying for entry into an instructor training course. These are more or less in accord with those of the National Association of Underwater Instructors. Each potential applicant must consult current publications of the various instructor training agencies for specific details. The following are general considerations:

A. Courses

1. Basic Skin and Scuba Diving (Certificate of training required)

2. Lifesaving (ARC Senior or equivalent required; ARC Water Safety Instructor or equivalent recommended)

3. First Aid (ARC Basic or equivalent required; ARC Advanced or Instructor or equivalent recommended)

4. CPR (ARC Basic or equivalent required; ARC cardio-pulmonary Resuscitation Instructor or equivalent recommended)

b. Watermanship

1. Swimming without skin diving equipment:

a. 400 yards in less than 10 minutes
b. Demonstrate at least two resting type swimming strokes in good form
c. Demonstrate survival swimming for 20 minutes (treading water, floating, drown-proofing techniques, etc.)
d. 25 yard underwater swim (without surfacing, no push-off
e. 50 yard underwater swim surfacing only three times to breathe
f. Tow a swimmer of equal size for 50 yards

2. Skin diving with mask, fins and snorkel:

a. Swim 880 yards nonstop, with all gear without using hands, in less than 20 minutes
b. Don all skin diving gear underwater on one breath
c. Demonstrate surface dives, water entries, buoyancy adjustment, various kicks with fins (front and back flutter, scissor, dolphin), underwater swimming and surfacing
d. Make a complete resuce of another skin diver

3. Scuba diving:

a. Buddy breathe and exchange breathing apparatus with another diver (without Scuba). Each must swim 50 yards wearing Scuba.
b. Tow a fully equipped Scuba diver 100 yards in less than 5 minutes.
c. Demonstrate ditch and recovery of Scuba in good form
d. Wearing Scuba equipment (full) swim 400 yards on the surface breathing with a snorkel
e. Purge water from mask underwater

4. Other

a. Age: 20 years or older

b. One year or more of diving experience since receiving basic Scuba certification with a total of at least three dives to a depth of 60 feet or more, and two dives to 40 feet or more, for a period of not less than 30 minutes. Both ocean and fresh water diving experience is recommended.

c. Good physical condition for Scuba diving as verified by a medical examination including a chest x-ray.

d. Own a complete set of skin and Scuba diving equipment including:

(1) Mask
(2) Fins
(3) Snorkel (with keeper)
(4) Personal flotation device (yoke-type with both compressed air and oral inflation)
(5) Complete wet suit
(6) Adjustable weight belt
(7) Knife
(8) Depth indicator (wrist type)
(9) Compass (underwater wrist type)
(10) Watch (underwater)
(11) Regulator
(12) Standard Scuba cylinder(s) with backpack or harness
(13) Adequate equipment bag, box or container

All equipment must be in proper working condition.

Self-Evaluation

A good instructor will develop a program of continuous self-evaluation. He must analyze each presentation, during and after the class session, to identify and correct any problem area. Some questions that he might ask himself are (from American Red Cross, Instructor's Manual: Cardio-pulmonary Resuscitation, 1974):

- Did the review indicate any area of misunderstanding?
- How effective were my teaching aides?
- Were my teaching method effective? How could they be made more effective?
- Did the class practice skills and change formations with a minimum of confusion?
- Were my demonstrations skillfully performed?

- Could all students see the demonstration?
- Could all students hear the descriptions (or lectures)?
- Did I summarize effectively?
- Were my students motivated to learn?
- How can I improve?

I am certain that other instructors can add to this list and develop their own criteria for self-evaluation of each lesson and course. One thing that tests are as much of an evaulation of the instructor as they are of the student. If a large number of students fail a test, quize or examination, consider that you, the instructor, might have failed in your responsibility of teaching.

Attire and Appearance

An effective instructor will dress "professionally." His attire will be neat and proper for the occasion. In college and some more formal lecture situations this may include a sport coat and tie; in other cases, a neat sport shirt is adequate. The instructor should not appear for any lecture in a dirty T-shirt and cut-off jeans. A stranger entering a classroom should be able to immediately identify the instructor among a group of probably less formally attired students. On the other hand, the instructor should avoid over-dressing for the situation; common sense and professional discretion are the best guides.

In the pool it is wise for the instructor to wear a jacket or T-shirt that clearly identifies him as the instructor. Some organizations will use orange T-shirts for all instructors in contrast to yellow T-shirts for assistants. The important fact is that all staff personnel are readily identified. A warm-up suit with the instructor's name (or name tag) on the front, an instructor organization emblem on the arm, and the word "INSTRUCTOR" across the back is excellent attire for pool, beach, and boat. "Patch jackets" are less desirable.

The good instructor's diving outfit will set an example and standard for his students. Many old-time divers pride themselves on custom designed scuba harnesses, their old suit, the 15 year old regulator that still works "as good as new," the excellent buoyancy vest that is no longer available for purchase and so on. When you are planning to become an instructor, you must also re-evaluate your diving outfit. Some general criteria to consider are:

- Every item of equipment in excellent condition.
- Use relatively new equipment if possible.
- Avoid the use of equipment that is not commonly available to your students. This includes custom designed equipment and obsolete equipment.
- Use a pressure gauge on your regulator (and preferably also a low-pressure warning system or reserve on the tank). This is becoming the standard of the community.
- Wear a single standard capcity cylinder or twin lower capacity cylinders (twin 50's, for example) when appropriate (does not apply for cave diving, of course). Wearing twin-80's will encourage students to purchase equipment for "image" purposes and this could lead to trouble.

- Use an auxiliary breathing system (octopus).
- Wear a watch and depth gauge (this sets a good example even if you know the depth and the divemaster keeps the time).

Do not "over-equip!" The instructor should avoid excessive use of accessories, complex equipment, etc., that are not really necessary.

When possible and acceptable, use the equipment that is "locally available." This is a professional courtesy to the dive shop and a thoughtful consideration for your students. If the instructor uses equipment that is unavailable in the local dive shop, the following consequences must be considered:

- The students will be "frustrated" when they go to purchase equipment and find that none of the equipment that their "instructor" uses is locally available. Even though equipment of equal quality is in the shop, the student really won't know this.
- The student will be encouraged to "mail order" equipment.
- The dive shop operator will find himself in an awkward and often discredited position if he attempts to promote equipment not used by the instructor.
- If the dive shop operator is dynamic and successful in promoting his equipment (which is not what the instructor uses), then a shadow of doubt or uncertainty is cast upon the instructor.

OTHER INSTRUCTIONAL PERSONNEL

Assistant Instructor of Skin and Scuba Diving

The Assistant Instructor of Skin and Scuba Diving shall hold a current assistant scuba instructor certification issued by the National Association of Underwater Instructors, Professional Association of Diving Instructors, or Young Mens

Christian Association's National Scuba Program. Persons holding an assistant instructor certification issued by any other organization shall be subject to special review by the head instructor. The assistant scuba instructor must be an active diver. In addition it is highly recommended that the individual hold nationally recognized certifications in lifesaving, first aid, and cardiopulmonary resuscitation. The assistant scuba instructor is not authorized to "take charge" or a scuba diving class in the absence of a scuba instructor. He or she may teach under the direct, on site supervision of a scuba diving instructor.

Practice Teacher: Scuba Diving

The practice teacher is an in-service trainee who has completed a basic scuba diving course, an instructor theory course, served as an instructor's aide and has acquired some practical diving experience. The practice teacher is authorized to teach all or portions of basic scuba diving classes only under the direct, on site supervision of an instructor. The instructor may at anytime "step in" to assure that proper instruction is given to basic students. In addition to the above prerequisites it is recommended that the practice teacher hold lifesaving and CPR certifications.

Instructor Aide: Scuba Diving

The instructor aide is an in-service trainee who has completed a basic scuba diving course. He is a novice scuba diver with limited practical diving experience. The aide

assists the instructor, assistant instructor, and practice teacher in demonstrations, filling scuba cylinders, record keeping, equipment maintenance, lifeguarding, providing special assistance for individual students, open water dives, etc. The aide is never allowed to work with students except under the direct supervision of an instructor. He has no in-water responsibilities on open water dives except to serve as a buddy for a new diver when accompanied by an instructor, to assist in demonstrations, etc.

TEACHING AND LEARNING

Numerous volumes have been written on the subject of teaching. Space does not permit an extensive or elaborate coverage of the subject in this report. Rather, I will present a number of aids or hints to better the instructor's understanding of the basic concepts of teaching. This information, in part, was modified from the Instructor's Manual : Cardiopulmonary Resuscitation by the American Red Cross (1974).

Lesson Planning

Since a solid lesson plan is fundamental to good teaching, let us first consider the basic elements of lesson planning:

- Unit or lesson objectives. The instructor should define objectives in terms of what students are to learn, what skills are to be developed, and what level of performance is expected.
- Elements involved. The instructor should determine the knowledge content and skills that must be presented in order to fulfill unit objectives. Consideration must be given to the present knowledge and performance of the student as well as to his/her future needs.

- Time schedule. The instructor should schedule specific blocks of time for each element to be learned and practiced. If insufficient time is available, unit objectives cannot be met, and time should be extended accordingly (or other appropriate adjustments made).

- Equipment. The instructor should itemize all equipment and materials necessary for each unit, so that nothing is forgotten.

- Instructor action. The instructor must determine what will be presented and how.

- Student action. Students should be able to understand all the information presented and should be given the opportunity to practice assigned skills.

- Evaluation. The instructor should evaluate student's knowledge and skill, based on established standards, and should use the information in planning subsequent lessons.

- Safety. Preparation should include measures for ensuring the safety of each participant, and the instructor should instill a safety attitude in students.

Classroom

Many instructors fail to recognize the importance of the "learning environment." They will lecture to students on the pool deck, in hallways, under a tree adjacent to the pool, and in unsuitable classrooms. Ideally, the classroom should:

- Be well lighted, well ventilated, and temperature controlled.

- Be arranged so that all can see, hear, and be seen. Have sufficient space to accommodate all students comfortably.

- Be free from distracting sounds and have good acoustics.

- Be free from distracting scenery and displays.

- Have ample space for demonstrations or practice (for CPR and first aid classes).

- Have basic training aids available, such as chalkboard, chalk and erasers, easel, instructor's table and lectern, 16 mm projector, slide projector, screen, bulletin board, pointer, etc.
- Be set up so that safety precautions are taken: fire extinguishers are available, exits are clear, there are no safety hazards, etc.

Pool

Unfortunately, the instructor will probably have less choice relative to pool facilities than classroom facilities. Often he will have to "make do." Health and safety of the students must be the primary concern.

A standard 75 foot swimming pool (generally 6 swimming lanes or wider) with a deep and shallow area is sufficient. Although a 12 to 15 foot deep diving well is desirable, 8 to 10 feet will suffice for deep water practice. Avoid pools without shallow "teaching area." It is desirable to have at least 8 to 10 feet of deck completely around the pool with a larger assembly/teaching area at one end. The deck area should be free of unnecessary/unusual obstructions, "slick" areas, etc. Properly stowed starting blocks, lane markers and lifesaving equipment are, of course, acceptable. The scuba teaching pool should include the following:

1. Standard lifesaving equipment including "Shepard's hook" or pole, ring buoy, backboards, and first aid supplies.
2. Separate pool office with direct view (unobstructed) of pool including telephone, public address systems, sofa or bed, and instructor's desk.

3. Oxygen inhalator.
4. 30^{o} tilt board for scuba accidents.
5. Secure storage area for all scuba diving associated equipment which is properly ventilated and includes a small workbench.
6. Scuba air filling system.
7. Underwater viewing window.
8. Public address and underwater speaker system.
9. Large chalkboard.
10. Large bulletin board (preferably glass covered).
11. Benches for students.

Naturally, each instructor and pool supervisor will have specific items which they may wish to add to this list. Also, the public address/underwater speaker system and underwater viewing window may not be available. Modifications in procedures will be required.

Although the instructor may not have a specific "voice" in pool management/maintenance, he must take into account any factors which will effect his teaching efficiency and/or the health and safety of his students. The new instructor should inspect the pool and associated facilities (locker rooms, showers, etc.) for:

1. Sanitation.
2. Security.
3. Lifesaving equipment.
4. Emergency procedure (including posting of emergency number and telephone location).
5. Dangerous deck, stairs, shower, etc. areas.

6. Underwater visibility.
7. Water purity (daily test record).
8. Lighting.
9. Acoustics.
10. Water and room temperature.

These are only the major items of concern. The instructor may have to modify his program or procedure to take into account uncorrectable inadequacies. For example, an increased number of aids will be necessary as lifeguards, both underwater and on the deck if lighting and underwater visibility are poor. It is the obligation of the instructor to communicate verbally and by date/signed memo any condition which in his opinion will effect the health and safety of the students to the pool director or manager. Copies of such memos must be maintained in a file.

The instructor should attempt to become acquainted with other instructors working at the facility, the pool manager or supervisor, the physical director (in case of YMCA or similar organization), the general director or manager, the pool maintenance personnel, the matrons or towel room personnel, the secretarial staff (which will prepare his materials), and other people associated with the pool organization or institution. A good working relationship is vital to the success of your class.

Effective Teaching

In order to be effective the instructor must observe some fundamental principles of teaching. The effective instructor will:

- Use a logical teaching progression. A student learns best when the instructor uses a logical, orderly progression in accord with the skill or knowledge level being taught. Teach from the known to the unknown; from the simple to the complex. The student should know "where he has been," "where he is," and "where he is going" in a logical scheme.

- Use complete lesson plans. Lessons must be planned in accord with best possible use of time and facilities. Learn to plan each step of your lesson and still maintain a degree of flexibility within that plan. Remember that what works for one class, might not work for another. Complete and detailed lesson planning involves time priority assessment. For example, you might have only 50 minutes to discuss the principle of operation of scuba, selection of personal scuba equipment and scuba maintenance. You may personally consider "hydrostatic testing of cylinders" to be a very interesting topic; however, using 15 minutes of class time to discuss that topic is "poor use of time" and a "misjudgement in priority assessment."

- Use a sound teaching approach. The instructor must approach the teaching-learning situation with confidence, enthusiasm, and patience. Confidence on the part of the instructor instills confidence in the student. Controlled enthusiasm minimizes fear, forestalls the onset of discouragement, and instills the desire to learn. Patience can be one of the instructor's strongest virtues. Students can, at times, be slow to comprehend and may make the same mistake over and over. It may take all of the patience that you can command to "keep your cool." Remember that the skill or subject is probably new to the student and his ability might not be equal to yours or others in the class. Keep in mind that each student is an individual. In your class of 10 you 10 reasons for wanting to learn to dive, 10 reactions to your presentation, and 10 potential problems that you may encounter with each

skill (or topic) you teach. Treat each student as an indivudal.

- Develop an ability to demonstrate. Proper demonstration of skills takes practice and planning. Plan demonstrations, coordinate between speaker and demonstrator, and practice. Demonstrations should be slow and deliberate. Emphasize each major step. A good demonstration may not be as smooth as the "final" skill performances, rather a "step by step" procedure. A large pool side illustration, even in the form of a series of stick figure drawings, may prove extremely beneficial. An excellent aid for both instructor and student practice is a large "unbreakable" mirror located underwater.

- Develop the ability to lecture. Lecturing is "organized" public speaking. It requires planning and practice. It is natural for novice instructors to be nervous and sometimes awkward in front of a class. The instructor can reduce these tensions by:

  - Using a highly organized and complete lecture outline which is typed or printed in large letters. It must be easy to follow.

  - Using visual aids that are well coordinated with the lecture notes. Indicate on the lecture notes when each visual aid is to be used.

  - Rehearse the lecture completely with the visual aids in the room you will be presenting it, if possible. Do this several times until the presentation flows smoothly.

  - Tape record your presentation several weeks to a week prior to making the presentation to aid in detecting awkward words, mistakes, etc. I recommend that you do not use this tape recording technique just prior (the day before) to presenting the lecture to the group. You may find that you sound "so bad" that it will affect your confidence. Don't be discouraged. Work for "smoothness!"

  - Some persons suggest practicing in front of a mirror. Use with discretion! This may make you overly self-conscious and thus contribute to your awkwardness.

- Dress comfortably but respectably. If you seldom wear a tie and if you are "uncomfortable" when you do wear one, certainly do not wear one when you lecture as a novice instructor. However, do not wear cut-offs and a T-shirt.

- Above all, know your subject. Do not read it from the lecture notes; these notes are only a guide and reminder. Novice instructors should read and reread basic text material on each lecture topic.

- Develop the ability to evaluate. A good teacher is a trained and skilled observer. Learn to analyze each skill. This analysis procedure can be aided by breaking each skill into a series of steps or isolated movements. Prior to working with your students, write out a "step by step" analysis of the skill with comments on how the skill is performed properly and where and what kind of mistakes you anticipate. In addition to evaluating the student, you must continuously evaluate yourself.

  Evaluation also includes written or oral examinations and quizzes. Preparing a good examination is an art in itself.

Given below are some of the qualities demonstrated by successful instructors that are closely related to the subjects of presenting a topic and teaching a skill:

- Use proper and careful language; think before you speak and avoid obsenities.

- Develop a smooth, well-projected speaking voice; adapt the loudness or volume to the room, size of audience, etc.

- Use voice inflections to emphasize; avoid a monotone voice.

- Maintain eye contact with all members of the class; do not speak to the chalkboard, floor, window, visual aid, or a single person.

- Exhibit a helpful attitude; respect all questions.

- Do not bluff and do not be afraid to say, "I don't know," but you should add, "I'll try to find out," or, "Let's refer to the text."

- Avoid sarcasm and argument.
- When proper, involve the class members in discussion and keep the discussion on the subject.
- Treat all class members fairly and equally.
- Be punctual and reliable.
- Learn the names and interests of the students.
- Avoid the use of such expressions as "I say," "You see," "always", "never," "ah...ah... ah," and so when presenting information. Substitutes such as "the textbook states,""authorities in the field recognize", "are there any questions on the material presented so far" (occasionally), "generally," and a simple pause.
- Be patient and exhibit a friendly attitude.
- Prepare material carefully and use a variety of teaching methods.
- Be enthusiastic and imaginative in the teaching approach.
- Keep control of your class. Be polite but firm; do not tolerate distractions such as students talking among themselves or making distracting noises while you lecture.
- Use motion! Do not stand in one spot; move around the speaker area and use hand jesters to emphasize points. On the other hand, do not run back and forth in front of the class or develop a rhythm of repeated movement.
- Do not smoke in front of your class!
- Relate to personal experiences with discretion; avoid "ego tripping."
- Avoid excessive and lengthy "sea stories."
- Always have the safety of the students in mind.

Efficient Use of Time

Efficient and effective use of "time" is one of the most important aspects of teaching. This is especially true in the pool/confined water portion of a course where facility time is limited by scheduling demands and, often, pool rental cost. Every minute in the pool must "count."

Instructors frequently make inefficient use of pool time by delivering lengthy, poorly organized, unnecessary and, often, impromptu lectures at pool side. The instructor must be an effective pool side lecturer; skills cannot be taught without some verbal explanation. However, detailed discussions, sea stories, descriptions of how a regulator functions, and so on are best presented in a classroom setting.

Pool side lectures must be brief and concise. Address only the specific information necessary for learning the skill and maintaining safety. Long periods of inactivity when the student is in the water or standing "wet" on the pool deck leads to chilling. Cold reduces learning! The instructor that likes to hear himself/herself talk may be "chilling" the students into an ineffective learning situation.

The same basic principles of lecturing that apply in the classroom also apply in the pool. Organization, voice, command, physical setting, visual aids, etc. are necessary for a successful concise lecture. Most instructors fail to recognize the importance of selected pool side visual aids. Furthermore, the pool training activities can be skillfully and effectively "introduced" in the classroom through the

use of slides or short movies.

Proper time utilization is one of our most important considerations in pool training. On the other hand, time can be a learning degradation factor. Time-pressure and task loading are major "psychological stressors." Trying to accomplish too much or teach too many skills in a given time period can significantly reduce "learning." The skilled instructor will watch for stress indicators. Physical stress indicators include shivering, fatigue, not paying attention, performance degradation, and so on. Psychological indicators include isolation away from group, breakdown in buddy system, lack of response to instructions, evident confusion, difficulty following instructions, evident frustation, emotional outburst (crying, etc.), reluctance to perform new or previously learned skills, a stressed facial expression, etc. Use time effectively and efficiently; however, do not let time work against you.

WHAT IS POOL TRAINING?

In a skin and scuba diving course pool training is preparation for open water training. We do not train people to be "pool divers." Consequently, every effort must be made to make the pool training "apply" to open water. Certainly, many of the skills are "emergency" rather than "routine" skills and are likely to never be used in open water except in an unfortunate emergency. In addition to emergency management, we must emphasize emergency prevention. Far too often over emphasis on emergency skills overshadows teaching

and learning routine skills.

The environmental conditions of the pool are significantly different than those of open water. Lacking are currents, waves, salt, depth, marine life, poor visibility, cold, distance, boats, full suits, and so on. This makes "meaningful" preparation for open water more difficult.

Instructors can use some common open water techniques during pool training. These include: ,

1. Never allow students to hold onto the side of the pool to rest; inflate BC as in open, deep water.
2. Enter at specific locations (as you would from a boat) and immeditely swim away to allow for safe entry of others.
3. Exit on ladders as if climbing a boat ladder; never allow another student to be under the exiting diver.
4. Mask on face when on surface; snorkel breathe.
5. Correct rate of ascent, 1 foot/second.
6. Deep water descent and ascent.
7. Buoyancy compensation (overweight at times to simulate wet suit compression).
8. Deep water exit into small boat (use side of pool as small boat) with buddy handing equipment or equipment lines hung over side of pool.
9. Wear gloves during some exercises.
10. Lost buddy drill.
11. Hand signal practice (learn early in course).
12. BC for every student in every session.
13. Submersible pressure gauge diving.
14. Post-dive maintenance of equipment as if salt water diving.

INSTRUCTOR NOTES:

CONFINED WATER/POOL TRAINING BASIC SCUBA DIVING COURSE OUTLINE

The following outline is based on 12 teaching sessions with approximately 90 minutes of student contact time per session. These outlines must be continuously revised/ upgraded as new information on teaching is acquired, as national standards change, and as diving equipment is improved or changed. I wish to emphasize that this is only a guide. If you choose to use this guide, you must review each portion and be certain that it conforms with the current standards of the sanctioning certification organization and the current standards of the diving community.

INSTRUCTOR NOTES:

WATER SESSION 1

A. Objectives

1. To orient student to pool facility.

2. To inform student of pool procedures and regulations.

3. To develop proper student appreciation and attitude towards the pool training offered in this course.

4. To evaluate student's watermanship-fitness.

B. Location: Swimming Pool _____

C. Materials and equipment

1. Class cards

2. Roll sheet

3. Clipboard/note pad and test record

4. Pencils

5. Release forms and/or special water-fitness test forms

6. Whistle/lanyard

7. Swim cap (for example)

8. Instructor jacket or T-shirt

9. Instructor certification (copy posted in pool office)

10. Oxygen unit, first aid supplies, backboard, and lifesaving equipment (standard at pool; check)

11. Stopwatch/lanyard and/or pool lap clock.

D. Outline of Instruction

1. Introduction

a. Assemble students in spectator seating area or appropriate lecture/discussion area

b. Introduction of instructor and assistants

(1) Names and title on board
(2) Verbal introduction

INSTRUCTOR NOTES:

c. Take roll (sample roll sheet attached)

(1) Use attendance sheet provided by supervisor (head instructor)
(2) Add names of late registered students

d. Check to insure that all persons have signed a release form

e. Record names of persons with current Senior Lifesaving (ARC or equivalent)

f. Record names of persons with current CPR

2. Pool Orientation

a. Pool: deep and shallow portions of pool, ladders

b. Diving locker: To be kept locked at all times except when class is in session. Gear may not be used from the diving locker during recreational swim, only during designated diving class sessions.

c. Pool Office, phone and emergency information

d. Oxygen unit, backboard, and first aid supplies

3. Pool procedures and regulations (brief explanations)

a. No swimming or practice unless a qualified diving instructor is in pool area.

b. Absolutely no "horse-play", running, etc. Serious injury can result from falls when wearing fins on pool decks or wearing scuba.

c. Showers; also thoroughly wash all personal diving equipment prior to use in the pool. Instructor will inspect.

d. Follow directions of matron or attendant regarding suits, towels, lockers, etc.

e. Persons with open wounds; illness, etc. must consult with the instructor prior to entering the pool; state public health laws must be observed.

f. No street shoes on pool deck.

g. Handle all equipment with extreme care. Scuba tanks and weight belts can do considerable damage to the tile.

INSTRUCTOR NOTES:

h. Do not wear fins on deck. When you leave the water, remove the fins.

i. No scuba tank should be left unattended in an upright position; always lay the tank down on its side or rest it on the packboard.

j. No personal equipment may be left at the pool or in the diving locker. Items may be left in the small lockers; however, the university is not responsible for loss of such items.

k. Stress that class will begin at 20 minutes past the hour and students will be expected to be on time.

l. Continued absence is a basis for being dropped from the class.

m. No scuba diving allowed when suffering from a cold, especially a chest cold. No smoking in locker room or pool area.

4. Emergency procedures (Procedures a and b should be presented to the class; other material is for instructor's information. Inform class that we have specific equipment and personnel for handling diving accidents at the university).

a. Immediately render aid to prevent drowning and notify nearest instructor (head or assistant).

(1) Reaching or equipment assisted rescue from side of pool.

(2) Swimming rescue if necessary (with assistance).

(3) If the victim was scuba diving and is found unconscious at the bottom of the pool, tilt head back when surfacing the victim to reduce the possibility of lung barotrauma.

(4) If a diving board accident, support (with assistance) the victim in a fashion to prevent movement of the neck and spine. A backboard will be required (standard equipment on wall at each end of the pool).

(5) Promptly start resuscitation if required.

b. Head instructor takes charge and assigns task.

c. If the victim is not breathing, start resuscitation immediately. Call the University Emergency number. Inform the Emergency Operator of the situation. They will call the Fire Department Rescue Unit for professional assistance. They will provide mechanical resuscitation and the Emergency operator will arrange transport to University Hospital.

UNIVERSITY EMERGENCY TELEPHONE: 123

INSTRUCTOR NOTES:

d. If the victim is breathing and was not using scuba, but appears to have "taken water" and feels "poorly", arrange transport to University Hospital Emergency Room. Place victim on oxygen at the discretion of the head instructor.

UNIVERSITY EMERGENCY TELEPHONE: 123

UNIVERSITY HOSPITAL EMERGENCY ROOM TELEPHONE: 4-5102

f. If the victim is breathing and was using scuba, place on a backboard in a 15° head down position slightly rotated to the left side. Administer pure oxygen. This is a potential air embolism.

(1) Arrange immediate transport to University Hospital.

UNIVERSITY EMERGENCY TELEPHONE: 123

(2) Notify Emergency Room that a scuba diving accident victim is on the way.

UNIVERSITY EMERGENCY ROOM TELEPHONE: 4-5102

(3) Notify diving medical specialist (if available). At University of Michigan contact:

Dr. Martin Nemiroff
TELEPHONE: 4-4244, Radio Page # 173
HOME TELEPHONE: 9-761-7928

g. Contact: (at University of Michigan)

Lee H. Somers: TELEPHONE 4-0597 or 4-4472

Department of Physical Education: TELEPHONE: 4-3473

5. Have all students sign a form attesting to their medical fitness prior to taking the water-fitness test (if not previously completed in lecture session).

6. Water-Fitness Test

a. Each student must demonstrate his/her swimming proficiency and satisfy the instructor that he/she is reasonably physicall fit.

b. The primary form water-fitness evaluation used at the UM is the 400 yd/10 min swim (without fins or swim aide).

(1) One person swims, the other counts lengths and keeps time. Assistant instructors should also monitor students, especially those who appear weak from the start. Swim 6 to 8 students at a time.

INSTRUCTOR NOTES:

(2) The head instructor or a designated assistant will record times and comments on a master record sheet.

(3) Persons not making the time requirement, but completing the 400 yards will be reviewed by the head instructor. In some cases, at his discretion, they will be given one or two weeks to complete the swim to the satisfaction of the instructor.

(4) Persons who do not complete the swim will be dropped from the course.

(5) Those who complete the swim but show very poor form in strokes and/or excessive fatigue will be counseled and encouraged to enroll in a swimming course and/or physical conditioning course in addition to the scuba course. Record such information in remarks column on data sheet.

c. Secondary test includes (without aids):

(1) 20 yard underwater swim (no push-off) or 25 yard underwater swim (with push-off or dive).

(a) Demonstrate underwater swim technique prior to test.

(b) Warn against excessive hyperventilation.

(c) Have lifeguards ready to go along both sides of pool.

(d) Record satisfactory/unsatisfactory; persons will be given additional opportunity to complete this swim if they pass other phases.

(2) 15 minute survival swim

(a) Student may use drown-proofing, treading, and/or floating; stay in one place.

(b) Have student tread water for at least one minute without use of hands.

(c) Record satisfactory/unsatisfactory.

(3) Some courses require a demonstration of a lifesaving tow prior to acceptance into the course. Since we cover lifesaving in the course, this is not a priority item. However, time permitting, have each student demonstrate his/her ability to recover a submerged inert person from 10 fsw and tow an inert swimmer 25 yards.

(a) Those students with prior lifesaving training may use the tow technique of their choice.

INSTRUCTOR NOTES:

(b) For those students without prior lifesaving training, demonstrate the following.

- Have the indert victim place his/ her right hand against the back of his/her head.

- The rescuer will grasp the victim's right wrist and hold the victim at arms' length.

- The rescuer will swim on his/her back or side using a scissors or other acceptable kick.

- This is the simulation technique for a "half-carry."

(4) 40 yard underwater swim, surfacing not more than 4 times (optional).

7. Closing class session

a. All persons who have failed water-fitness test are informed and not allowed to continue in pool portion of course. They may:

(1) Drop course completely.

(2) Remain in course and attend lectures only; a pass/fail grade will issued for theory only.

(3) Encourage them to enroll in swimming class, probably intermediate level.

b. Be certain that all Waiting List people accepted into the course go register and officially enroll in course; give permission slip.

c. Emphasize need for swimming fitness and physical fitness. Encourage enrollment in a lifesaving course and a routine personal fitness program.

d. Emphasize promptness and attendance for next session.

e. Dismiss class and hold special consultations for those who have minor swimming/fitness problems; etc.

8. Forward evaluation records to head instructor immediately.

INSTRUCTOR NOTES:

WATER SESSION 2

A. Objectives

1. To develop proper student attitude to safety and correct diving procedures.

2. To develop the student's understanding and ability in the use and maintenance of mask, fins, snorkel, and buoyancy vest.

3. To introduce the student to basic concepts and techniques of lifesaving and water safety.

4. To develop the student's skill in basic skin diving techniques.

B. Facilities: Swimming Pool _____

C. Materials and Equipment

1. Roll sheet

2. Clipboard/note pad

3. Pencils

4. Whistle/lanyard

5. Instructor pool attire

6. Instructor certification (copy posted at pool)

7. Oxygen unit, first aid supplies, backboard, and lifesaving equipment (standard at pool; check)

8. Stopwatch/lanyard

9. Mask, fins, snorkel, weightbelt, cap, and buoyancy vest; one outfit for each student and instructor

10. Teaching notes

11. Underwater speaker unit

D. Outline of Instruction

1. Introduction

a. Take roll

(1) Determine if all students have been evaluated, are officially registered, and have signed release form.

(2) Admit waiting list people if space is available

INSTRUCTOR NOTES:

b. Water-fitness test for those who were absent the first week (if only one or two persons, complete at end of session; see WATER SESSION 1; use assistant instructor for this exercise)

c. Read announcements, if any

d. Motivation for skin diving/lifesaving sessions

(1) Training for open ocean diving, not pool

(2) Skills are basic to the rest of the course and all phases of diving

(3) Skin and scuba diving is 60% "brains" and 40% "skill"; think, learn to move efficiently and effortlessly; prevent getting into trouble

(a) Over-exertion

(b) Exceeding one's limits

(c) Think before you act; anticipate

2. Buddy system

a. Safety in two-person teams (three, if odd number)

b. Attitude, state-of-mind, a constant awareness, etc.

c. Most aspects of course built around buddy system principle.

(1) Instruction/learning aid/evaluation

(2) Assist with equipment

(3) Safety check; if equipment is improperly assembled or fitted, it is the buddy's responsibility as well as the principal diver's responsibility

(4) Personal lifeguard

(5) Stay together underwater and on the surface

(6) Select buddy immediately upon arrival at the pool (or even before arrival)

d. A few exercises will be used that will require buddies to temporarily separate

e. When and if we "call", we want you within 10 ft of your buddy.

INSTRUCTOR NOTES:

3. Diving locker orientation

    a. Location

    b. Fins and flotation vest are numbered and are always placed on appropriate pegs corresponding to the fin number; mask and snorkel are hung on peg above the fin; weight belts

    c. Insist on neatness and returning equipment to the proper location

    d. Students may select fins, mask, snorkel, and weight belts immediately upon arrival if instructor is present; also scuba in later classes per instructions

    e. Handle all equipment with care

    f. None of this equipment is for "openwater" diving; the abuse of continuous class use has caused disqualification; defects and damage may be evident

    g. Inform instructor of specific malfunctions

    h. Students who wish to use their own equipment

        (1) Encourage purchase and use of own equipment

        (2) Must be clean

        (3) Must be inspected and approved by instructor

        (4) The University is <u>not</u> responsible for loss or theft; personal equipment may not be stored in diving locker

4. Assemble students with complete equipment for phase one instructions (flotation vest) do not have them put equipment on; semi-circle arrangement is desirable; complete gear includes mask, snorkel, vest, and weight belt (1 weight sufficient)

5. Flotation vest

    a. Previously described types, selections, and features in lecture

    b. Student familiarization

        (1) Mechanical inflator (CO_2)

            (a) Parts

            (b) Remove CO_2 cylinder

            (c) Use of dummy CO_2 cylinders in general class use; cost; always have good cylinder for diving

INSTRUCTOR NOTES:

(d) Check firing mechanism

(e) Replace cylinder

(f) Discuss lubrication and maintenance

(g) Air inflation to be explained later

(2) Oral inflator

(a) Valve mechanism: open/close

(b) Inflate: depress valve

(c) Inspect for leaks at full inflation by dunking in pool; listen for air escape

(d) Deflate: depress with thumb ; press air out

(e) CAUTION: Never suck air out of vest; harmful bacteria, potential of lung infection

(3) Harness

(a) Inspect

(b) D-ring hitch or snap hooks

c. Donning vest

(1) Adjustment

(2) Harness secure

(3) Snug but not restricting on full inhalation; not loose

d. Locate inflator "by feel"

e. Oral inflation and deflation

f. Maintenance

(1) Drain water

(2) Partially inflate

(3) Replace on peg to dry

g. INSTRUCTOR NOTES

(1) Prior to class

(a) Check all units for leaks; repair if necessary; leave one or two leaks for demonstration purposes

INSTRUCTOR NOTES:

(b) Clean and lubricate all mechanical inflators; insert dummy cylinders (marked); wipe away excess lubricant

(c) Have 2 or 3 charged CO_2 cylinders available

(2) Emphasize "DO NOT SUCK AIR OUT OF VEST"

6. Weight belt (with one 3 lb weight)

a. Previously described in lecture

b. Student familiarization

(1) Webbing

(2) Weight (place to middle of back for this exercise)

(3) Buckle: secure, quick release

c. Have student fit belt and secure

d. Drop belt with buddy catching weight; replace

e. INSTRUCTOR NOTES

(1) Prior to class

(a) Reshape and treat frayed ends

(b) Adjust to average length

(c) Place one weight on each belt

(d) Check buckles

(2) CAUTION: Do not drop on deck or chip pool side tile!

7. Move to shallow end of pool for next phase of instruction

a. Have half of class sit on each side of pool at shallow end; mask, fins, and snorkel at their sides

b. Place one assistant or aid on each side; head instructor and demonstrator in middle; FORMATION 1

8. Fins

a. Selection and proper sizing previously described in lecture

b. Students were instructed to bring clean, heavy weight socks or neoprene boots to prevent blistering

INSTRUCTOR NOTES:

c. Familiarization

(1) Blade

(2) Foot pocket

(3) Heal strap/buckles

d. Adjustment and fitting

(1) Opening buckle system

(2) Slide foot in pocket; adjust, and secure

(3) CAUTION: Excessive stretching and abuse of heal strap should be avoided

3. Donning fins (sitting on pool edge)

(1) Cross legs forming a "figure 4" (left foot over right leg)

(2) Grasp fin in left hand by the side or rib at instep level

(3) With strap under the foot, slide the foot completely into the pocket and carefully pull strap into place

(4) CAUTION: Do not pull on fin by strap

(5) Alternate method for shoe type fin

(a) Turn heal portion inside out

(b) Slide fin into foot pocket as above

(c) Reposition heal portion

(d) CAUTION: Do not pull fin on by the thin portion of the heal

(6) Repeat for other foot

(7) Fins may be removed using an opposite procedure; again avoid excessive stress on heal strap

(8) Have students slide into water and repeat procedure in standing position; use buddy and/or side of pool as support

f. Walking in shallow water with fins

(1) Fins are for swimming, not walking; special techniques required

(2) CAUTION: Do not walk on deck with fins; remove

INSTRUCTOR NOTES:

(3) Have students walk forward to demonstrate difficulty

(4) Have students return to side by sliding feet backwards

(5) Shuttle sideways to center of pool and return to wall.

9. Return to side, stand in water and pick up mask.

10. Mask

a. Previously described selection and features in lecture

b. Student familiarization

(1) Strap/buckles

(2) Lens

(3) Mask body

(4) Sealing ridge

c. Testing for fit

(1) Place head strap in front of mask

(2) Place comfortably on face covering nose and eyes (assistants and aids make quick check to see if masks are placed properly)

(3) Inhale through nose; if mask is sucked to face, air does leak in around edges, and mask stays in place without being held, the fit is satisfactory; if mask falls from face or excessive air leakage, the fit is unsatisfactory.

(4) Wetting the face and mask edge enhance fitting

(5) This procedure also tests purge valve seal

d. Inspect strap; damaged straps may result in loss of mask

e. Donning mask (two hands)

(1) Grasp the mask by the face plate retainer rim in one hand with face plate toward palm of hand

(2) Grasp strap in other hand (finger tips downward)

(3) Place the mask over eyes and nose with the skirt edge flaring out all around

(4) Place strap over back of head just above occipital process (small bump at base of skull)

(5) If a split strap is used, separate segments about 1.5 inches

INSTRUCTOR NOTES:

(6) Adjust for comfort

(a) Strap snug but not tight

(b) Excessive tightness causes headaches

(c) Excessive looseness may result in loss of mask

(7) CAUTION: Students should not "over-stretch" the strap

f. Donning mask (one hand)

(1) Useful in rough seas when one hand is required for stability

(2) Grasp the mask as before with free hand; hold side of pool with other hand; strap over front of mask

(3) Place mask into position on face and inhale slightly through nose to hold in place

(4) Quickly, with same hand, bring strap over head and position for security and comfort

g. Defogging procedure

(1) NOte that some fog or condensation may be forming on inside of mask

(2) Remove mask

(3) Rub saliva over inside of face plate

(4) Rinse

(5) Replace mask

(6) Cleaning mask lens and commercial compounds were discussed in lecture

h. Mask in place or around neck when not in use; do not place on top of head

11. Snorkels

a. Previously discussed types and selection in lecture

b. Student familiarization

(1) Tube

(2) Configuration/material

(3) Mouthpiece

INSTRUCTOR NOTES:

(4) Retainer

c. Donning snorkel

(1) Use retainer in most actual diving

(2) Slide the snorkel tube under the mask strap

(3) Insert the mouthpiece in mouth, flange between lips and teeth, and the small "bits" (or equivalent) held lightly between the teeth

(4) Be sure to exhale through snorkel before drawing first breath in case there is water, dirt, or other foreign material in the tube (a good habit)

(5) Position snorkel so that it is at a 10-15^{o} angle (from vertical) when in face down position; readjustments will be made when you start swimming

(6) Assistant or aid checks position and mouthpiece placement

12. Snorkel breathing / mask adjustments

a. Student position: half of class lined up along wall on each side of pool at about one arms length between individuals; assistant or aid facing group; buddy may face buddy; FORMATION 2

b. Practice breathing through snorkel with face out of water

c. Bend over on knee to place face in water looking downward and slightly forward

(1) Continue "normal" breathing

(2) Check for mask leakage

(3) Take several moderately deep breaths, hold last one, duck head and tube underwater

(4) Lift head until snorkel is clear and "blow" water from snorkel; take first breath cautiously

13. Kicking demonstration and practice

a. Demonstration

(1) Students standing in water at sides of pool; instructor explains from deck; assistant swims down center; FORMATION 3

(2) Have assistant swim slowly and continuously

INSTRUCTOR NOTES:

(3) Instructor points out features of good kick

(a) Modification of conventional crawl stroke flutter kick

(b) Movement from hip

(c) Kick cycle speed: very slow and deliberate

(d) Feet separated only far enough to prevent fins from hitting; kick depth 18 inches or more (experiment) for comfort and efficiency

(e) Knees flex, but not kick from knees (no bicycle pumping action); no stiff legs

(f) Toes pointed, ankles flexed

(g) Fins not break water; only heel may hit surface; no splash

(h) Hips at or slightly below water line; body straight; don't bend at hips; don't have body at steep angle; weight belt for buoyant hip individuals

(i) No arm movements; let drag at side

(j) Stress conservation of energy and concentration; keep smooth continuous cycle

(4) Have students view kick underwater by kneeling down and breathing through snorkel; repeat "features"

(5) Have assistant hold side of pool at end and continue kicking; again repeat "features"

(6) Answer questions

b. Practice position: Student grasps pool gutter lip with one hand and presses palm against pool side about 18 inches below surface; spread out at least arms length separation; one side behind and, if available, a second side on deck above

c. Bring body to a horizontal position and float on surface; lightly kick fins up and down if you can't stay up; face in water breathing through snorkel; ears above water line so you can hear instructions

d. Students practice kick; instructor repeats "features" of good kick; allow time for assistants to make individual corrections

e. Have one buddy observe and correct while other buddy kicks; assistants continue to point out problems

INSTRUCTOR NOTES:

f. Continue until student kicking form is satisfactory; stop, rest and emphasize major problems; answer questions; allow assistants to comment

g. INSTRUCTOR NOTES: Common kicking faults

(1) Excessive knee flexture, bicycle pumping action (diminished power and thrust)

(2) Stiff legs and ankles (rapid fatigue)

(3) Flatfooted (back drag and power loss)

(4) Excessive body roll (may result from stiff leg kick)

(5) Too deep or shallow of kick

(6) Too high or low of hip position

(7) Kicking too fast

(8) Pauses in kick cycle, lack of steady rhythm

h. Swimming lengths (kick only)

(1) Two groups, single file; clockwise movement; assistant on deck (each side of pool) and in center of each group; might be desirable to have center divider line; FORMATION 4

(2) Instructor makes corrections over underwater speaker; assistants are lifeguards and pick out individuals that will require special help; call out student and fault to instructor

(3) Continue for 4 to 6 slow circles, instructor controls pace and keeps swimmers spread out; terminate in shallow end

(4) Debrief, if necessary, before going to next exercise.

14. Tread water / remove and replace weight belt / vest inflation-deflation

a. Demonstration

(1) Assistant in deep water; students stand at top of slope; instructor gives verbal description; students view underwater; FORMATION 5

(2) Assistant treads water

(a) Slow flutter kick in vertical position

(b) Figure "8" squalling, palms down

INSTRUCTOR NOTES:

(c) Face in water breathing through snorkel; stress weight of head, approximately 10 lbs

(d) Without hands; fold across body

(3) Assistant removes and replaces weight belt "by feel"

(4) Assistant orally inflates vest

(a) Tube position

(b) Snorkel to tube maneuver

(c) Totally inflate, float motionless

(d) Hands hold front of vest for comfort

(e) Deflate; specific note of body and tube position; total deflation

(f) INSTRUCTOR NOTE: Ideally use two assistants, one with standard swimmer type vest front mount inflator, second with BC type collar mount inflator

(g) INSTRUCTOR NOTE: Indicate that buoyancy compensators will be demonstrated later in course if swimmer type surface flotation vests are used for this lesson

(5) Answer questions; repeat demonstrations as necessary

(6) INSTRUCTOR NOTE: The instructor may choose to "talk" class through the above exercise over speaker system

(a) Disregard, with discretion, portions of the demonstrations

(b) Use assistants in water for immediate correction

(c) Requires speaker system

b. Buddy Team move to deep water; FORMATION 6

c. Execute exercises

(1) Tread water: with and without hands; lift head and hands above head to demonstrate added stress

(2) Remove and replace weight belt; 3 times

(3) Vest inflation-deflation

(a) Repeat 3 times

(b) Deflate to approximately 1/2 inflation last time

INSTRUCTOR NOTES:

d. Stay in position for next exercise

15. Surface dives

a. Demonstrate

(1) FORMATION 5

(2) Assistant demonstrates; instructor explains each

(3) Hyperventilation and breathholding have been discussed in lecture, no need to repeat here

b. Warn students about equalizing pressure; demonstrate hand position on mask; this topic was discussed in lecture; be certain everyone understood principle and necessity

(1) Press mask skirt against nostrils

(2) Pinch nostrils

(3) "NO EAR PLUGS"

(4) "START EQUALIZATION IMMEDIATELY"

(5) Have each practice "gentle" equalization at surface

c. Feet-first dive

(1) Vertical position

(2) Kick strongly with fins and, at same time bring arms to sides; elevates upper body out of water

(3) Point toes, relax, drop vertically

(4) When submerged, turn on side or face down, and swim downward at angle

d. Surfacing and snorkel pruging (displacement method)

(1) During ascent look up toward the surface to check for overhead obstructions; rotate 360^{O}; one hand overhead

(2) Snorkel is pointing at an angle downward

(3) Gently expel a small amount of air into snorkel at about 2 feet below the surface; because of the downward slant of snorkel, air is trapped in the tube and the water is displaced

(4) At the surface simply roll the head forward into the usual swimming position and <u>cautiously</u> resume breathing.

INSTRUCTOR NOTES:

(5) CAUTION: First breath might have spray of water

(6) Stress effortlessness of this method of purging

e. Head-first or jack knife dive

(1) Swimming position

(2) Take several moderately deep breaths to ventilate lungs and hold last one

(3) Bend the body at the waist, thrusting the upper body down, and throwing the legs upward to a vertical position

(a) Body vertical

(b) Hand to mask immediately for purging

(c) Legs together, toes pointed

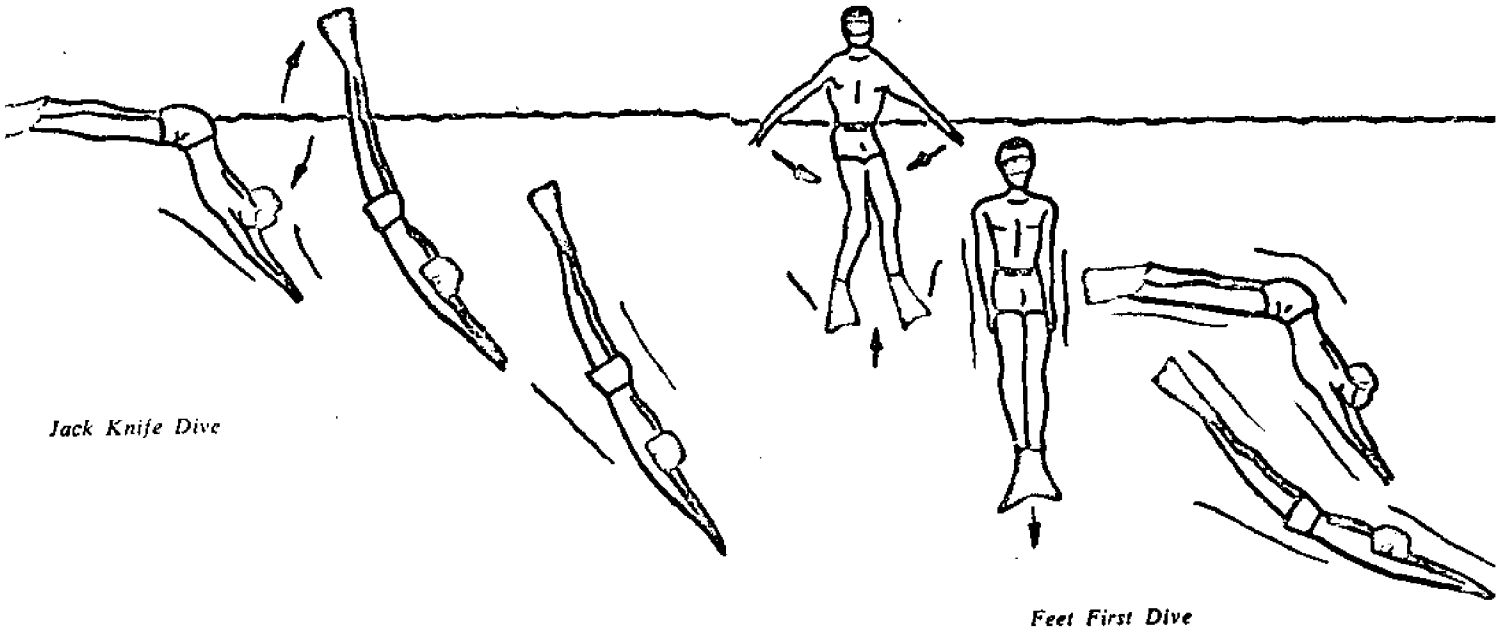
(d) Weight off legs sufficient to push body down in water; no kick until fins are submerged

(4) Swim to bottom, ears permitting; "don't push it if you can't equalize"

(5) Swim short distance along bottom and surface as described in "15.d"

(6) Both will execute at some time during observed practice

(7) Buddy should swim on surface, observe, and correct faults, during practice



Jack Knife Dive

Feet First Dive

INSTRUCTOR NOTES:

(8) Common faults to be aware of

(a) Not sufficient bend at waist; body not coming to vertical position

(b) Legs not thrust high enough

(c) Legs separated; toes not pointed; kicking before submerged

(d) Only partial snorkel purging underwater

(e) Tendancy for hurried and jerky, rather than quiet, smooth flowing movements

f. Execute dives

(1) FORMATION 7

(2) Keep them moving; instructor corrects by speaker and/or assistant corrects individuals

(3) Each student does 3 surface dives of each type; assistants call out corrections

(4) Slow kick underwater swim back to end of line is acceptable

(a) Hands at sides

(b) Easy kick; same features as in surface kick

16. Lifesaving

a. FORMATION 6

b. Self-rescue

(1) Stop, think, relax

(2) Oral inflation (just completed)

(3) Mechanical inflation:

(a) Locate inflator mechanism "by feel"

(4) Cramp release (foot)

(a) Float face down

(b) Grasp fin ribs with one hand on each side

(c) Pull toes toward knee

INSTRUCTOR NOTES:

(5) Cramp release (calf)

(a) Above procedure may also work for calf

(b) Knead cramped muscle

(6) INSTRUCTOR NOTE: Assistant may demonstrate and/or instructor may talk class through exercise

(7) Class exercise

c. Second party rescue

(1) FORMATION 5

(2) Verbal rescue (may be most effective)

(a) Approach (visible to victim if possible), comfort, reassure: "You're OK!", "Relax!", "Inflate your vest!", "You're OK!"

(b) Keep talking and get victim to inflate his vest; avoid contact if possible; don't lose sight of victim

(3) Front underwater approach

(a) About 6-8 ft away surface dive, head first or feet first

(b) Swim, grasp at knees, and turn body

(c) Move up, sliding hands; don't pull victim down

(d) Release belt

(e) Simulate mechanical vest inflation

(4) Rear approach

(a) Assume quick escape position and ease in toward victim

(b) Place left hand under arm pit and reach around to release belt - inflate vest with right hand

(c) Level off with right hand in center of lower back; push upward

(5) Student practices approaches and contact

(a) FORMATION 8

(b) Execute approaches, contact, and level

INSTRUCTOR NOTES:

(6) INSTRUCTOR NOTE: Talking the class through second party rescues is difficult; instructor and assistant on deck should also demonstrate dry land style

d. Fin push

(1) Demonstration

(a) Instructor explains

(b) Students stay in position they were practicing in

(c) Assistants demonstrate

(2) One buddy orally inflates vest and lays flat on water

(3) Rescuer places shoulders against fins, grasps legs, and pushes in surface swimming position

(4) Practice: FORMATION 4

17. Equipment removal and replacement

a. Tread water, no air in vest; FORMATION 6

b. Remove right fin

c. Remove left fin

d. Remove mask and snorkel

e. Can slide fins and mask over arm

f. Tread

g. Tread with gear held above hand (briefly)

h. Replace fins

i. Replace mask and snorkel

j. Swim to shallow water to rest

18. Supervised practice period

a. Student's choice

b. Instructor corrects obvious problems; assistant with clipboard will call out problems and student's name

c. Three assistants in the water and one on deck as lifeguard; instructor supervises and functions as required

d. Skill enhancement games may be used at this time.

INSTRUCTOR NOTES:

19. Wash and stow equipment

    a. One assistant at wash area, one assistant in dive locker

    b. Rinse mask and snorkel in "disinfectant solution," if available, followed by fresh water rinse

    c. Rinse fins and vest in fresh water

    d. Drain vest; partially inflate

    e. Shake off excess water

    f. Return to proper number hook

    g. Report damaged gear to assistant in dive locker

    h. Assistant in dive locker checks to see that all is returned

20. Staff debriefing

    a. Record "problem students" with specific comments on problems

    b. Identify any instructional problems

    c. Evaluate efficiency and effectiveness

    d. Assignments for next week

    e. Special help assignments

21. Records (by instructor)

    a. Attendance: students and assistants

    b. Assume all students in attendance completed skill "satisfactorily" unless recorded under "problem student"

    c. Complete skill checklist

    d. Record any pertinant data from debriefing that will aid in teaching future classes

    e. Record equipment malfunctions

22. Stow and secure personal gear

INSTRUCTOR NOTES:

23. Timetable (designates time completed)*

00:00	Students assembled
00:02	Roll
00:06	Announcements and introduction
00:10	Buddy system
00:18	Diving locker orientation and gear selection; at demonstration area
00:25	Flotation vest and weight belt
00:26	Assembled at shallow end
00:35	Fins, mask, snorkel
00:45	Kicking
00:55	Tread water/remove and replace weight belt/ vest inflation - deflation
01:05	Surface dives
01:15	Lifesaving
01:20	Equipment removal and replacement
01:30	Wash and stow equipment

*This is only a rough guide to aid "novice" instructors in "pacing" themselves.

INSTRUCTOR NOTES:

WATER SESSION 3

A. Objectives

1. Review fundamentals of skin diving equipment and technique.

2. Review lifesaving approaches, contact of victim, and introduce towing victim.

3. To instruct students in methods of recovering a submerged unconscious skin diver and position him for artificial respiration.

4. To teach students how to execute stride and roll-in entries.

B. Facilities: Swimming Pool _____

C. Materials and equipment

1. Roll sheet

2. Clipboard/note pad/record sheet

3. Pencils

4. Whistle/lanyard

5. Instructor jacket or T-shirt/ swim cap

6. Instructor certification (copy posted in office)

7. Oxygen unit; first aid supplied, backboard, and lifesaving equipment (standard at pool; check)

8. Stopwatch/lanyard and/or pool lap timer

9. Mask, fins, snorkel, weight belt, cap and flotation vest for each student, assistant instructor, and instructor

10. Teaching notes

11. Record of "student problems" and absentees from Session 2

12. Hand signal poster

13. Underwater speaker unit

D. Outline of Instruction

1. Introduction

a. Answer questions

INSTRUCTOR NOTES:

b. Take roll

(1) Enrollment completion

(2) Be certain all entry tests and forms are completed

c. Announcements, if any

d. Hand signal poster

(1) Review basic hand signals

(2) Students review before and after class

e. Motivation

(1) Training for open water diving

(2) Personal and buddy safety

(3) Knowledge, skill, and fitness

(4) Concentrate on each exercise or skill; detect and correct your own mistakes

(5) The lifesaving learned in this class may save your life or the life of your buddy someday

(6) Buddy system

f. Buddy selection

2. Equipment selection and assembly

a. Obtain equipment from diving locker

b. FORMATION 8, students go directly; assistant observes and supervises donning of equipment

c. Inspect, fit, and don

3. Entries

a. Demonstration

(1) Students seated on edge of pool

(2) Instructor describes entry; assistant demonstrates; emphasize each point

(3) To save time the instructor may demonstrate both stride and forward rool entry before allowing any class practice

b. Forward roll from sitting position (from low pool side or water level platforms)

INSTRUCTOR NOTES:

(1) Be certain no divers or obstructions below

(2) Sit on edge of pool, heals on edge of trough or gutter

(3) Hold mask with elbow tucked to chest

(4) Entry is started by tucking chin and rolling forward in somersault fashion

(5) Land on shoulders; at impact the shoulder penetrates the water first

(6) Recover to a swimming position

(7) Climb out of pool

c. Stride or step-in entry (used from dock, poolside, stable platform, large boat, etc.)

(1) Hold mask firmly against face with one hand; other arm extended to side and slightly forward (not above shoulder level)

(2) In smooth action, step forward over water (don't jump); looking straight ahead, not down

(3) Lead foot will strike the water heal first and trail foot will strike on top of fin

(4) CAUTION: Do not let students leap into water with both feet together; the fins upon striking the water could plane and cause the diver to fall backward thus striking head on pool edge; looking down may cause "Belly-flop"

(5) As the body sinks into the water make a sharp scissor-type kick and sweep arm downward

d. Student practice

(1) One buddy executes; other buddy corrects and helps buddy out of pool

(2) Assistants make corrections

(3) Practice each entry at least 3 times

(4) Return to edge of pool, sit, and await instructions

(5) Instructor may wish to have one student execute entry at a time down the line; make corrections as you go; this is a time consuming but effective technique that may be used on the first performance of each type of entry

INSTRUCTOR NOTES:

(6) Instruct students to never position themselves directly below a person climbing a ladder in case that person were to slip and fall back into the water; preparation for boat diving.

4. Review surface swimming and skin diving

   a. FORMATION 4

   b. Instruct students on swimming sequence prior to entry

   c. Sequence

      (1) First two laps easy surface snorkeling

      (2) Third and fourth laps surface dive head first as you pass over slope to deep water, swim almost to wall, surface properly.

      (3) Fifth and sixth laps repeat "2" with feet first surface dive

      (4) At end of sixth lap return to position next to wall in deep end; tread water, don't hang on wall

   d. Instructor continues to repeat sequence over speaker

   e. Assistants call out "corrections", instructor repeats over speaker; record "problem students" for later special work

5. Review weight belt removal-replacement/ vest inflation-deflation

   a. FORMATION 6

   b. Weight belt

   c. Vest

6. Oral inflation of buddy's vest (lifesaving assist)

   a. In same formation, assistant chooses student for demonstration

   b. Instruct student to relax

   c. Assistant inflates student's vest from behind or side in a control position, support student by grasping under arm.

   d. Each student inflates buddy's vest

7. Towing a breathing diver

   a. Demonstration; FORMATION 8

INSTRUCTOR NOTES:

b. Tow by neck of vest or simulated hair carry; victim inflates vest prior to start of tow; holds front of vest down for comfort

c. Positions (rescuer)

(1) Snorkel position; tow at arm's length

(2) Swim on back, vest inflated; talking to victim

d. Execute

(1) FORMATION 4

(2) Each individual tows a victim two laps with each towing position

e. Have students tow one lap without inflated vest to emphasize importance of vest

f. INSTRUCTOR NOTE: Victim places hand against back of head, rescuer grasps wrist; more comfortable for endurance and swim skill development

8. Recovery of submerged skin diver

a. Demonstration

(1) FORMATION 5

(2) Instructor explains; assistants perform, 2 or 3 times

(3) Emphasize main points; slow motion execution at first

(4) Victim face down

(5) Students view underwater

b. Swim to position approximately above victim

c. Head-first surface dive

d. Grasp victim's arm, turn over

e. Drop weight belt, simulate vest inflation

f. Pull to surface by arm

g. This is a good exercise to demonstrate underwater vest inflation

h. Position for artificial respiration

INSTRUCTOR NOTES:

(1) At surface assume a position so victim is to right of and facing the rescuer

(2) The rescuer will reach between the victim's right arm and body (as if hooking elbows with victim)

(3) The rescuer grasps the collar of the victim's vest to facilitate tilting the head back

(4) This will be used later in simulated artificial respiration exercises

i. Students execute

(1) FORMATION 9

(2) Swim out; victim dives to bottom just before rescuer arrives

(3) At surface put into position for artificial respiration

9. Introduction to controlled emergency swimming ascent

a. Preparation for scuba training; air embolism and principles of emergency ascent have been discussed (or will be) in lecture

b. Demonstration

(1) FORMATION 5

(2) Assistant demonstrates; slow and deliberate; point to each major feature of exercise

c. Simulated CESA

(1) Dive to bottom

(2) Assume kneeling position; facing class (demonstrator) or assistant instructor (student)

(3) Head back

(4) Exhale (humming)

(5) Hands raised over head

(6) Swim slowly to surface

(7) Continue to exhale all the way to the surface

INSTRUCTOR NOTES:

(8) Repeat twice

(9) Answer questions

d. Students swim out from observation position; practice 4 to 6 times; assistants make corrections; instructor repeats key points over speaker several times

10. Tread water in deep end of pool; remove mask, fins, and snorkel, hold over head, and replace

11. Snorkel without mask

a. FORMATION 4

b. Swim single file

c. Mask over arm, hold snorkel in place, swim 2 laps (100 yards) breathing through snorkel

d. Instructor keeps control; assistants prevent bunching up

12. Mouth-to-mouth artificial respiration in water

a. Demonstration

(1) FORMATION 10

(2) Instructor explains; assistant demonstrators rotate to various positions

b. Position for artificial respiration

(1) Victim's vest inflated

(2) Victim is to right of and facing rescuer

(3) Rescuer will reach between victim's right arm and body; reach up and grasp collar of victim's vest to facilitate tilting the head back

(4) Remove victim's mask and snorkel with left hand; press palm on forehead and pinch nostrils closed with thumb and forefinger; stay low in water as you would be if not standing

(5) Rotate victim toward you so you can place your mouth on his to administer air

(6) Simulate getting air into victim 12 times per minute

INSTRUCTOR NOTES:

(7) Students execute; assistants will roam among group to make corrections.

13. Swim 450 yards with mask, fins, and snorkel, nonstop, using no hands

    a. FORMATION 4

    b. Speed not essential; concentrate on relaxed breathing and proper kick

    c. Be alert for blisters and foot discomfort; instruct students to discontinue swim if foot problem develops

    d. At end of swim have all students remove mask, fins and snorkel and swim 50 yards; note difficulties.

14. Supervised practice period (see "18" in Session 2)

15. Wash and stow equipment (see "19" in Session 2)

16. Debriefing (see "20" in Session 2)

17. Records (see "21" in Session 2)

18. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 4

A. Objectives

1. To introduce the student to the pre-dive assembly, safety check, use, and post-dive disassembly/maintenance of open-circuit scuba.

2. To provide an opportunity for students to practice using scuba underwater.

3. To instruct the student in the emergency procedures of swimming underwater using scuba without a face mask and purging water from a regulator.

B. Location: Swimming Pool _____

C. Materials and equipment

1. Items 1-10 listed for Session 3.

2. Record of student problems, absentees from Session 3.

3. Regulator, cylinder, and backpack for each student, assistant instructor, and instructor.

4. Cylinder pressure gauges (3)

5. Regulator with submersible pressure gauge (for demonstration and use by students/staff).

6. Buddy check poster

7. Underwater speaker system

D. Outline of Instruction

1. Introduction

a. Answer questions

b. Take roll

c. Announcements, if any

d. Buddy check poster, study before and after class

e. Motivation

(1) Training for open ocean diving

(2) Personal and buddy safety

INSTRUCTOR NOTES:

(3) Intelligence, skill, and fitness

(a) This session requires concentration and simply "think before you act"

(b) The habits in handling equipment developed today will set the trend for your diving career.

f. Buddy selection

2. Equipment handling/ scuba assembly demonstration

a. It is best to demonstrate the procedure before you allow students to handle scuba; may do in lecture using slides or movie

b. Instructor selects regulator, cylinder, and backpack before class and has them ready for demonstration

c. Emphasize and explain each move

d. The details of regulator function, valve function, cylinders, and backpacks have been (or will be discussed in lecture); go directly to handling and assembly.

e. Position

(1) Near diving board or in bleachers

(2) FORMATION 11

f. Handling regulator

(1) Remove from hook (describe and show what part to hook regulator by)

(2) Do not drop; handle with care; damaged regulator could cost you your life.

(3) Pressure gauge attachment

(4) Dust cap removal; point out dust screen

g. Handling cylinders

(1) Handle with care; explosive/propellant potential; through wall, injure handler or bystander

(2) Carrying

(a) Handle (backpack; cylinder)

(b) Valve; precaution

INSTRUCTOR NOTES:

(3) Never leave standing; cylinder boot for protection; lay it down when you leave the cylinder unattended

h. Backpack

(1) Screws for adjustment

(2) Quick release buckels/snaps

(3) Harness adjustments

(4) Cylinder securing lever (Dacor model)

i. Full cylinders, reserve lever up; empty or used cylinder, reserve lever down; 1500 psi fill (generally) or enough so the student will experience air supply depletion at end of session

j. Pre-dive assembly and check

(1) Adjust backpack harness, comfortable but not too tight or loose; inspect to see if wing nuts are in place; buckel and snaps functionable

(2) Place backpack on cylinder; top of pack approximately level to base of valve; valve orifice toward diver's back; secure cam lever and check wing nuts

(3) Slightly open valve (counter-clockwise turn) and allow rush of air to expel any water or foreign matter from orifice

(4) Inspect o-ring; stress importance of o-ring

(5) Checking cylinder pressure

(a) Pressure gauges located in diving locker on panel

(b) Attach pressure gauge yoke to cylinder valve by placing the gauge "seat" against the valve o-ring and tightening the yoke screw; thumb tight, don't over-tighten

(c) Close bleeder valve (clockwise)

(d) Open cylinder valve slowly (counter-clockwise); don't look at gauge face; potential but slight danger

(e) Read pressure; reserve lever down

(f) Close cylinder valve (clockwise)

(g) Open bleeder valve (counter-clockwise)

INSTRUCTOR NOTES:

(h) Return reserve lever to "up" position

(i) Remove pressure gauge; pass to another student or replace on board

(6) Regulator inspection (before removing dust cap)

(a) Place mouthpiece in mouth and exhale; if you can't exhale, hold mouthpiece underwater for about one minute, and attempt exhalation again; if unsuccessful, see instructor

(b) Inhale gently; if you get air, check with instructor; possible exhaust valve or diaphragm damage; you will get air if dust cap has been removed

(c) Inspect hose for damage; see instructor if inner fiber core material is exposed

(7) Loosen yoke screw and remove dust cap

(8) Place regulator on cylinder valve by placing the regulator "seat" against the o-ring and tigtening o-ring; never over tighten, just thumb tight

(a) Single hose regulator goes over left shoulder; generally passes next to on/off valve

(b) Double hose regulator "V" is up

(9) Gently turn on air (counter-clockwise); open full; don't force, and back off about 1/2 turn

(10) If your regulator is equipped with a pressure gauge, do not look at pressure gauge when turning on air; potential danger of cover face being blown out (rare)

(11) Inhale from regulator, air should flow freely; if considerable breathing resistance, notify instructor

(12) Possible malfunctions

(a) Free flow; diaphragm depressed, blow into regulator

(b) Air leak from 1st stage: internal damage

(c) INSTRUCTOR NOTE: Inform students that an occasional malfunction can be expected due to excessive abuse to regulators and cylinder valves in training; the regulators and cylinders are never allowed for openwater diving; DO NOT DIVE WITH MALFUNCTIONING EQUIPMENT!

INSTRUCTOR NOTES:

(13) Reserve lever in up position

(14) Familiarize students with purge button and its function

3. Students go to diving locker and acquire:

   a. Mask, fins, snorkel, and weightbelt

   b. Regulator, cylinder, and backpack

   c. INSTRUCTOR NOTE: Have one or two assistants in diving locker to aid students

   d. Two or three trips may be required, encourage students to not attempt carrying everyting at one time

4. Students assemble scuba under direct supervision of instructor/ assistant instructors. Use 2.k as a guide.

   a. Students should be guided in step-by-step procedure

   b. Correct and explain mistakes

   c. Let the student do as much as possible; don't assemble the scuba for him/her.

5. Final instructions on proper ascent procedure

   a. Stress "do not hold your breath"; exhale

   b. Emergency in shallow water; exhale

   c. Air embolism potential

   d. Equalization of pressure in ears

6. Familiarization exercise in the pool*

   a. Have students (in buddy pairs) place scuba on edge of pool and themselves don fins; enter water

   b. With assistance from the staff and each other don scuba while standing in shallow water; in water final inspection; don mask

   c. Practice breathing on the surface

   d. This is where you switch to the underwater speaker; part e will be directed in this fashion; if speaker is not available, arrange to have students surface on signal like tapping on a piece of pipe or tapping on arm by an assistant

*See section at the end of outline for alternate method

INSTRUCTOR NOTES:

e. Descend slowly to a face in water position, then to kneeling position; stress equalization

(1) Stress slow inhalation - exhalation; relax; do not hold breath

(2) Assistants check eyes for anxiety and breathing patterns

(3) Further submerge to lie prone on bottom

(4) Caution students not to overinflate lungs

(5) Continue to breathe in one position for at least 5 to ten minutes

(6) Have assistants watch for and correct buoyancy problems

(7) Move around the shallow end by crawling on bottom or by easy, slow swimming

(8) Surface only on signal or if problem arises; exhale

(9) If you have persons in class with previous diving experience, you must "control" them

(a) Do not let them progress to more complex activities until the class does

(b) Do not let them start novice students on exercises before you are ready

(c) If you let them, they'll attempt to do the entire course the first day; it is your class!

(10) Call students to the surface; answer questions and reinforce safety and confidence

(11) Explain purging mouthpiece underwater

(a) Hold breath

(b) Remove mouthpiece

(c) Look ahead or slightly up; exhaust valve at lowest point

(d) Replace and purge water by sharp exhalation

(e) Time permitting, have students purge regulator using purge botton techniques

- Hold breath and remove regulator

INSTRUCTOR NOTES:

- Replace, block opening with tongue and press purge button; caution about not blocking the mouthpiece and the potential of a water spray down throat

- Repeat by having them insert while free flowing

- Finally, if class appears ready, have them purge regulator after exhaling part of most of air from lungs to simulate purging when no lung air is available

(12) Caution students not to depress purge buttons underwater if there air supply is exhausted; this could result in water entering the internal mechanism of the regulator and the cylinder

(13) Warn students that air supply may be running low and ask them to activate reserve when this happens; if no u/w speaker, be sure to warn of this prior to submergence (They have been informed already in lecture)

(14) Warn students again (over u/w speaker) about exhaling during ascent

(15) Ascend and terminate

7. Remove scuba and place on side of pool; warn not to damage pool tile; remove fins/mask and exit water

8. Carry scuba to disassembly area near diving board

9. Post-dive disassembly; demonstration followed by supervised practice

   a. Turn off air; do not force

   b. Purge air from regulator

   c. Remove regulator

   d. DRY and replace dust cap; stress drying and proper seating; secure with yoke screw

   e. Remove packback (if required)

   f. Place reserve lever down

   g. Wash cylinders, backpack, and regulator with fresh water from hose if available

INSTRUCTOR NOTES:

h. Altenate method of regulator washing is submerging in a disinfectant solution and then a clean water rinse (used in our class); do not depress purge button

i. Don't leave cylinders standing upright

10. Stow equipment in proper location in locker; assistant supervise

11. Summarize key points

a. Pre-dive assembly and check

b. Relax; breathing pattern

c. Do not hold breath

d. Purging regulator

e. Post-dive maintenance

f. Motivate

12. Supervised practice period

a. Students choice

b. Assistants aid in skin diving lifesaving

c. One assistant on deck as lifeguard; three in water

13. Debriefing (see "20" in Session 2)

14. Records (see "21" in Session 2)

15. Stow and secure personal equipment

16. Alternate procedure for familiarization exercise ("6"); used very successfully by some instructors

a. Have students place assembled scuba on edge of pool; shallow end

b. Student enters water without fins or mask; fins and mask placed on bottom of pool

c. With assistance of buddy and staff, students take scuba into water and hold in hands

d. While holding scuba only, not on back proceed wtih c, d and e of section 6.

INSTRUCTOR NOTES:

e. This exercise proves that the diver can easily survive under awkward conditions, that a mask is not necessary for underwater swimming and breathing, and that the loss of a fin is not a disaster if the diver is "cool"; it is stressful for a few but beneficial

f. Use at your discretion but only in shallow end of pool at this time

g. Have students don scuba while underwater; instruct them to do so using underwater speaker. They must figure out procedure on own; this is a "problem solving" exercise (optional; can wait until Session 5).

h. Have students, while submerged, obtain mask/fins from end of pool (optional; can wait until Session 5).

i. Don fin (optional; can wait until Session 5).

j. Don mask; only instruct to displace water and trap air in mask; this is a "problem solving" exercise (optional; can wait until Session 5).

k. Students can swim to deep end at discretion of instructor; emphasize equalizing pressure (optional).

l. Surface only in shallow end; exhale as they come up slope.

INSTRUCTOR NOTES:

WATER SESSION 5

A. Objectives

1. To review fundamental aspects of scuba assembly, use, disassembly, and maintenance.

2. To instruct the student in procedures for purging water from regulator and mask while submerged.

3. To introduce the student to deep water swimming with scuba and proper deep water ascent procedure.

4. To instruct the student in surface swimming techniques while wearing scuba including buoyancy vest inflation, snorkel swimming, and swimming on back.

5. To develop a proper and a safe attitude toward diving with scuba.

B. Location: Swimming Pool _____

C. Materials and equipment: See Water Session 4

D. Outline of Instruction

1. Introduction

a. Take roll

b. Answer questions

c. Announcements, if any

d. Motivation

(1) Training for open ocean diving

(2) Personal and buddy safety

(3) Think

(4) Habits

(5) Equipment familiarization

(6) Cope with emergency situations

e. Buddy selection

INSTRUCTOR NOTES:

2. Review equipment handling/scuba assembly

   a. Student will select equipment from diving locker: mask, fins, snorkel, vest, scuba, and weight belt

   b. Instructor aide supervises diving locker

   c. Assign one instructor aide or assistant per two buddy pairs

   d. Students assemble under direct supervision of aides

3. Introduce first elements of buddy check

   a. Is my buddy properly equipped for this dive?

      (1) Mask

      (2) Fins

      (3) Snorkel

      (4) Scuba

         (a) Back pack secure and adjusted

         (b) Regulator

         (c) Pressure gauge

      (5) Weight belt

      (6) Buoyancy vest

   b. Does my buddy have a full air cylinder? Check gauge.

   c. Is my buddy's reserve lever "up"?

   d. Does my buddy's emergency vest inflation mechanism function properly? Is his CO_2 cylinder "full"? Where is the inflation mechanism? How does it work?

   e. Where are my buddy's weight belt and scuba harness releases?

   f. Is my buddy propoerly trained and experienced for this dive? Was he in attendance at the last class?

4. Review familiarization swimming in shallow water

   a. Enter shallow water; put on equipment in the water

   b. Both head instructor, aides, and assistants stress proper breathing and exhalation (do not hold breath) during ascent; do this prior to allowing students to descend

INSTRUCTOR NOTES:

c. Use Water Session 4, D.2, D.6, and D.16 as guide

5. Review purging water from mouthpiece, see Water Session 4, D.6.e. (11)

6. For persons who used D.16 in Water Session 4 only

   a. Have students put fins and mask on bottom at end of pool

   b. Upon completion of regulator purging have students sit or kneel on bottom and direct, by speaker, to inspect scuba harness and donn scuba underwater

   c. This is a "self-oriented problem solving exercise"; only aid if absolutely necessary; ask them to solve this donning problem underwater; do not surface

   d. Have aides insure that scuba is properly fitted

   e. Have students recover fins and put them on

   f. Have students place mask on face and purge; only tell them that they are to replace the water with air by trapping air in the mask

   g. Have aide verify success-failure; this is a "self-oriented problem solving exercise

   h. Have aide assist students who are having serious trouble

   i. Instruct the students in proper or corrected procedure as in D.7 of this exercise

7. Swimming underwater without mask

   a. Have students remove mask

   b. Submerge, breathe, and swim underwater without mask

   c. If they wish to hold their nose, you can allow this at first, but have them progress to breathing without holding their nose

8. Purging mask

   a. Mask purging can be conducted for either group at this time

   b. For persons who are operating under the D.16/Session 4 "self-oriented problem solving system", they should attempt this with no prior instruction (see D.6 of this unit)

INSTRUCTOR NOTES:

c. Reasons for purging

(1) Mask accidentally dislodges

(2) Seepage

(3) Fog removal

(4) Panic prevention

d. Mask with purge valve

(1) Valve at lowest position relative to rest of mask

(2) Exhale through nose

(3) Press top portion of mask against forehead to prevent air loss

e. Mask without purge valve

(1) In a kneeling position, lift mask slightly from face and fill with water, tilt the head backward and look up at approximately a 45° angle toward the surface

(2) Press the top of the mask to your forehead

(3) Exhale steadily through nose; the exhaled air will displace the trapped water and force it out around the lower edge of the mask

f. Instructor should demonstrate position above water and then submerged

g. Do not let students lift mask away from face while purging; a common mistake

h. Do this exercise in shallow water first; repeat later in the period in deep water

9. Evaluate all students

a. Is equipment fitted properly?

b. Is the breathing pattern relaxed and acceptable?

c. Can they swim and breathe underwater without a mask?

d. Can they purge the regulator? Purge the mask?

e. Do they appear relaxed? At ease with equipment?

INSTRUCTOR NOTES:

f. If so, they are now ready to proceed to deep water

10. Deep water exercise

a. Assemble on surface or instruct over underwater speaker

(1) Equalization will be required

(2) If forced to surface; exhale all the way

(3) Air embolism potential: WARN

(4) What it is like to run out of air; breathing restriction, activate reserve, return to shallow water

b. Place one or two instructor aides on bottom with scuba and two aides on surface with snorkels; watch and control

c. Have students slowly descend down slope by buddy pair; equalize

d. Buoyancy compensation will be taught in a later period; assistant instructor will aid students in proper weight belt selection on individual basis; keep them a bit negative for this session

e. Upon reaching deep water, spread out by buddy pair

(1) Relax

(2) Practice regulator purge

(3) Practice mask purge

(4) Breathe from scuba in different positions

(a) On back

(b) On side

(c) Stand on head

(5) Somersault and roll swimming; learn to experience freedom of 3-D movement

(a) Do not hold breath: CAUTION

(b) Learn to "know your position in the water column at all times". Are you rising? Are you sinking? Concentrate!

11. Ascent exercise

a. Using the underwater speaker, have the students assemble, facing the slope, lying prone, at the bottom of the slope

INSTRUCTOR NOTES:

b. Counting seconds have them ascend up the slope at 1 foot per second; they should reach the top of the slope in about 7 seconds.

c. Have them return to the bottom and repeat

d. Stress the slow rate of ascent for all phases of pool activity

12. Surface swimming, scuba in place, using snorkel

a. Swim two laps (circles around pool, clockwise) without vest inflated using snorkel

b. Stop in deep water and inflate vest

c. Swim two laps with vest inflated and using snorkel

13. Fin push with scuba, vest inflated

14. Supervised practice period with scuba; finish off air supply; special help; leave pool by deep end ladder as on boat, no student under ladder

15. Disassemble and stow equipment; see Water Session 4/D.9

16. Stow equipment

17. Summarize key points

a. Buddy check

b. Deep water swimming

c. Mask purging

d. Surface swimming

e. Ascent rate

f. Rescue assist

18. Supervised swimming and skin diving; special help

19. Debrief

20. Records

21. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 6

A. Objectives

1. To execute deep water stride entry, descent, and ascent.

2. To teach the students how to execute a deep water emergency ascent.

3. To teach the students the fundamentals of buoyancy compensation.

B. Facilities: Swimming Pool _____

C. Equipment and materials

1. All items listed for Water Session 4

2. Oral and scuba inflated BC for demonstration

D. Outline of instruction

1. Introduction

a. Answer questions

b. Take roll

c. Announcements, if any

d. Motivation

(1) Training for ocean diving

(2) Coping with unexpected emergency

(3) Anticipation and concentration

(4) Buoyancy control

(a) Conserve energy

(b) Not substitute for watermanship and fitness

2. Equipment selection and assembly

a. Students acquire from diving locker

b. Assemble, inspect, don

c. Buddy check

d. Instructors supervise

INSTRUCTOR NOTES:

3. Stride entry

    a. Water Session 4, D.3.c

    b. One trial at this point; with scuba

    c. Emphasize "do not hold your breath" as you come back to surface immediately after entry; swim away from entry point

    e. Some people prefer to have students snorkel breath for entry; also vest partially inflated; instructor choice

4. Descend in deep water; feet first; equalize pressure (emphasize)

5. Practice underwater swimming with scuba, swimming without a mask, mask purging, and regulator purging

6. Surface in deep water; finger walk wall

    a. Emphasize "breathe normally" and do not hold breath

    b. Some people will be heavy; have them kick harder; buoyancy compensation later

    c. Count 1 to 12 seconds; students will start prone on bottom of deep end (use u/w speaker)

7. Buoyancy compensation demonstration and student practice

    a. Formation 5 for demonstration

    b. Demonstration

        (1) One aide demonstrates properly weighted diver

            (a) Emphasize proper selection of weight belt

            (b) At full breath float at about nose level

            (c) At exhalation, sink to position with head submerged

            (d) At normal inflation, float any place in water column

            (e) Descend and lie on bottom, show rise and fall with inhalation and exhalation

        (2) Second aide is heavily weighted (about 4-6 pounds negative)

            (a) Inflate normal swimmer type vest on bottom (orally)

            (b) Obtain neutral buoyancy

INSTRUCTOR NOTES:

(c) Deflate vest; emphasize position required to deflate this type

(d) Emphasize difficulty and discourage swimmer vest as BC

(e) Vent prior to ascent; stress difficulty of venting during ascent

(3) Third aide; heavily weighted; demonstrates oral inflated BC

(a) Swim with inflated BC on surface; deflate, descend

(b) Oral inflation on bottom

(c) Vent air on bottom

(d) Reinflate and demonstrate controlled ascent, venting air during ascent

(e) Emphasize control and avoiding excessive ascent rate

(4) Fourth aide; heavily weighted; demonstrate push-button scuba inflated BC

(a) Inflate on surface

(b) Vent air and descend

(c) Inflate to neutral buoyancy on bottom

(d) Controlled ascent; vent

(e) Emphasize control and avoiding excessive ascent rate

c. Student practice with BC type vest; 3 to 6 pounds on weight belt; oral inflation technique

(1) Descend

(2) Practice inflating to neutral buoyancy; swim

(3) Deflate on bottom; completely

(4) Repeat at least 6 or 8 times

(5) Practice control during ascent

d. Ascend to shallow water, vest deflated; remove weight belt, swim to deep end and check for buoyancy without weights; make minor adjustments as required; aides supervise individuals

INSTRUCTOR NOTES:

8. Emergency ascent demonstration and practice

    a. Formation 5 for demonstration

    b. Aide descends to bottom

    c. To resolve emergency; do not practice in open water; probably better than buddy breathing

    d. Steps in CESA procedure

        (1) Kneeling on bottom

        (2) Head extended back

        (3) Exhalation of air before leaving bottom (partial not total); emphasize

        (4) Hands over head

        (5) "Slow" swimming ascent, continue exhalation throughout

        (6) Both instructor and aide emphasize each move

        (7) Emphasize "do not hold your breath"

    e. Students practice same under close individual supervision of staff; vent air from vest before or during ascent (depends on vest, dress, etc.); 12 ft ascent

    f. Practice several times under close supervision; very slow controlled ascents

9. Have all students surface in deep water and tread water for 3 minutes

10. Surface swim 3 circles around pool

11. Assemble in shallow water with scuba still on; summary

    a. Buoyancy compensation use and abuse

    b. Emergency ascent precautions, use, and abuse

12. Supervised practice period

    a. Student choice

    b. Aides supervise and assist

    c. One aide lifeguard on deck; three in water

13. Students disassemble and stow equipment; aide supervises

14. Debrief (see "20" in Session 2)

15. Records (See "21" in Session 2)

16. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 7

A. Objectives

1. Provide students with an opportunity for make-up, special assistance, and practice.

2. Evaluate student progress to date.

3. Provide students with an opportunity to use oral and scuba inflated BC (in addition to standard flotation vest).

B. Location: Swimming Pool _____

C. Equipment and Materials: See Water Session 6

D. Outline of instruction

1. Introduction

   a. Answer questions

   b. Take roll

   c. Announcements, if any

   d. Motivation

      (1) Periodic self-evaluation

      (2) Now is the time to identify and correct problems

2. Assign one aide to each 2 buddy pairs (4 students)

   a. Aide will have a checklist with names and skills to be checked

   b. Aide will work with that group throughout period

   c. Aide will record a satisfactory(S) or unsatisfactory(U) for each skill or procedure listed

3. Equipment selection and assembly; including buddy check

4. Practice and special help for 15 minutes; each group work independently

5. Evaluation

   a. Each aid uses 1/4 width of pool

   b. Record results intervals

   c. Sequence evaluation (list posted)

INSTRUCTOR NOTES:

(1) Did student assemble equipment properly?

(2) Did student execute buddy check?

(3) Stride entry

(4) Snorkel swim (scuba on back) for two lengths

(5) Inflate vest; rest

(6) Deflate vest

(7) Feet first scuba descent

(8) Buoyancy compensate

(9) Remove mask and swim underwater without

(10) Replace and purge mask

(11) Remove, replace, and purge regulator mouthpiece

(12) Proper rate of ascent to shallow end; remove scuba and place on side of pool

(13) Inflate vest and fin push for two lengths each

(14) Simulated unconscious skin diver deep water rescue; position for and simulate artificial respiration (students may stop momentarily after ascent for oral vest inflation); tow to shallow end while simulating

(15) Head first skin dive; proper snorkel purge

(16) Feet first skin dive; proper snorkel purge

(17) Front underwater lifesaving approach, level-off, short tow

d. Record results of initial evaluation but make corrections as mistakes occur

e. Debrief and general evaluation; discussion

6. BC practice

a. Each person will be provided with an oral and/or scuba inflated BC

b. Use Water Session 6 as guide; each student uses both types of BC

7. Supervised practice period; skill enhancement games optional

INSTRUCTOR NOTES:

8. Deep water exit

    a. Remove scuba, buddy hold

    b. Exit by push up onto pool edge

    c. Take your scuba and buddy's scuba

    d. Buddy exit

9. Students disassemble and stow equipment; aide supervises and records mistakes

10. Debrief (see "20" in Session 2)

11. Records (see "21" in Session 2)

    a. Aides inform instructor of specific problems

    b. Compile data on master sheet

12. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 8

A. Objectives

1. To review emergency ascent and buoyancy compensation.

2. To instruct the students in proper procedures for buddy breathing.

3. To instruct the student in scuba diver rescue techniques.

B. Location: Swimming Pool _____

C. Equipment and materials: See Water Session 6

D. Outline of instruction

1. Introduction

   a. Answer questions

   b. Take roll

   c. Announcements, if any
   d. Motivation
      (1) Save your buddy's life

      (2) The role of the buddy

      (3) Anticipation, decision making

      (4) Self-rescue

2. Assemble equipment, check, don, buddy check; practice until all in water

3. Review 12 ft emergency ascent; execute 40 ft ascent by swimming across bottom and then ascending upward; talk through exercise on speaker

4. Review buoyancy compensation; talk through exercise on speaker

5. Sharing air with another diver

   a. Demonstration FORMATION 5

   b. Two aides on bottom

   c. Kneeling position demonstration

      (1) Position

         (a) Face each other, kneeling, right knee to right knee

         (b) Donor grasps cylinder harness of buddy with left hand

INSTRUCTOR NOTES:

(c) Grasp regulator in right hand; do not cover purge button

(2) Receiver drops mouthpiece from mouth, donor passes to buddy; donor retains physical control, buddy guides regulator to mouth, purge and take two breaths

(3) Donor exhales small stream of bubbles; simulate exhalation during ascent

(4) Inform student that BC venting may be necessary; think about when you would do it

(5) Buddy releases regulator; donor returns regulator to his mouth and takes two breaths

(6) Continue exchange procedure in kneeling position for 8 or 10 breaths

d. Prone position demonstration

(1) Position

(a) Receiver lies on bottom of pool

(b) Donor positions to receiver's right side

(c) Donor lies on right side and grasps scuba assembly or harness of receiver

(2) Proceed as above

e. Student practice; shallow water; one aide per four students

(1) Students kneel on bottom separately

(a) Remove regulator

(b) Slow exhale; count to 5

(c) Replace and purge

(2) Kneeling position; talk through on speaker; practice

(3) Prone position; talk through on speaker; practice

(4) Swimming in prone position; neutral buoyancy; circles around deep end

f. Student practice; deep water

6. Submerged scuba diver recovery

a. Demonstration FORMATION 5

b. One aide on bottom; one aide as rescuer

INSTRUCTOR NOTES:

c. Demonstration (show and explain)

(1) Rescuer approaches victim

(2) Position for ascent, grasp under arm

(3) Release weights

(4) Tilt head back

(5) Swim to surface; control

(6) If you start to get out of control and can't vent victim's vest; let him carry you to surface or, if necessary, let him go; don't hurt yourself

(7) Inflate vest (simulate)

(8) Get several breaths into victim (simulate)

(9) Remove victim's scuba with minimum interference with ventilation; another aide will take scuba

(10) Remove rescuer's scuba; aide will take scuba

(11) Continue rescue breathing (simulate) throughout

(12) Stress familiarity with buddy's scuba harness and BC assembly

(13) Do not attempt long term rescue breathing or towing with scuba in place

(14) Emphasize immediate action

(15) Emphasize prevention of air embolism when surfacing

d. Students " walk through" procedure in shallow water; one aide per four students

e. Students proceed to deep water and complete under supervision of aide

7. Supervised practice period; BC practice; skill enhancement games optional

8. Students disassemble and stow equipment; aide supervises

9. Students surface swim 400 yards without any equipment; time permitting

10. Debrief (see "20" in Session 2)

11. Records (see "21" in Session 2)

12. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 9

A. Objectives

1. To review buddy breathing.

2. To demonstrate and practice the use of auxiliary second stage on scuba for emergency breathing.

3. To practice donning and doffing scuba underwater.

4. To execute a proper simulated 75 foot emergency swimming ascent.

5. To demonstrate the use of a backpack mounted buoyancy system.

B. Location: Swimming Pool _____

C. Equipment and materials

1. See Water Session 6

2. Backmounted buoyancy system or stablizer jacket

D. Outline of instruction

1. Introduction

a. Answer questions

b. Take roll

c. Announcement, if any

d. Motivation

(1) Buddy breathing (?)

(2) Significance of the auxiliary second stage

(3) Significance of the emergency swimming ascent

2. Equipment selection and assembly; including buddy check

3. Back entry; demonstration and practice

a. Setting on edge of pool or starting block, back to water

b. Grasp buddy's arm (optional)

c. Hold mask

d. Let go and fall backwards; land on cylinders or buttock

e. Practice

INSTRUCTOR NOTES:

4. Students practice buddy breathing in stationary and horizontal swimming position; see Water Session 8

5. Demonstrate use of auxiliary second stage for sharing air

   a. Underwater speaker technique; have students assemble around demonstration team in deep water

   b. Use speaker; use FORMATION 5

   c. One aide with special scuba

   d. Other aide swims up, signals distress, and takes auxiliary second stage from aide

   e. Stress desirability of this method

6. Donning and doffing scuba underwater

   a. FORMATION 5

   b. Useful for freeing oneself from entanglement, confidence builder

   c. Aides demonstrate; one in kneeling position and one in setting position

   d. Aide in kneeling position removes scuba by unsnapping left shoulder strap and the waist strap; swing unit to right by grasping right shoulder harness and holding in front; replace with reverse maneuver

   e. Aide in setting position removes scuba by releasing waist belt and bringing scuba over head; replace with reverse movement; be certain regulator hose is inside of arms and harness

   f. Aides repeat; stabilize scuba on bottom; exhale and execute a proper controlled emergency swimming ascent; weight belt left with scuba (unless wearing a wet suit jacket)

   g. Dive down, stable position, replace scuba

   h. Students practice; slow progression

      (1) Remove and replace scuba; 3 - 5 times; eyes closed

      (2) Remove scuba, place on bottom, swim away and return for breath; repeat several times increasing distance each time; be aware of buoyancy, stay on bottom

      (3) When student appears comfortable and confident, have him remove unit, EXHALE, and execute controlled emergency swimming ascent, leave scuba on bottom; CAUTION about exhaling

      (4) Repeat above exercise without a mask

INSTRUCTOR NOTES:

(5) Caution students with neoprene jackets to leave weight belts on; it is desirable for all to be slightly negative

7. Seventy-five foot ascent

   a. For those students that are comfortable and confident only

   b. Remove scuba at deep end and wall, place on bottom

   c. Start exhaling

   d. Swim horizontally along bottom toward shallow end, exhale all the way

   e. Attempt to continue to end of pool; surface when necessary however; EXHALE

   f. Rest, ventilate

   g. Submerge and swim back to scuba underwater; 1/2 length at first, full length in later repetitions; breathe from scuba and don

   h. Have students turn air off before leaving scuba; therefore they must turn air on when they return

8. Backmounted BC/stabilizer demonstration and practice (optional)

   a. FORMATION 5; face shallow end first

   b. Aide with assembled BC equipped scuba on deck

   c. Inflate bag unit overpressure valve releases (a safety check)

   d. Scuba on deck of pool, lay on tank, valve toward water

   e. Aide enters water and pulls unit into water; floating position

   f. Put on over head

      (1) Unit in front, valve toward stomach, pack up

      (2) Arms through straps to just past elbows

      (3) Submerge, let unit float tank over your head

      (4) Tilt forward about 18°

      (5) Snap arms to side; tank should fall into place

      (6) Pull waist strap to get proper adjustment; buckle

INSTRUCTOR NOTES:

g. Snorkel to deep water; switch to regulator

h. Hold hose over head; push deflator; submerge

i. Control descent by putting small amount of air into bag as suit compresses

j. Adjust buoyancy on bottom; swim in all positions

k. When ready to ascend, kick upward and deflate as required to retain a neutral state

l. At surface inflate bag completely, release waist strap, drop underwater and bring unit overhead

m. Tow to shallow end

n. The above represents only part of the skills required for proper use of unit; special instruction from professional shop

o. Students inspect and answer questions

p. Supervised practice; one aide per student/unit; student removes his scuba and places it on side of pool

9. Surface swim with scuba; 440 yards snorkel breathing; vest may be inflated

10. Assemble in shallow water with scuba still on; summarize

11. Supervise practice period; skill enhancement games optional

a. See Water Session 6

b. Back-mounted unit

12. Students disassemble and stow equipment; aide supervises

13. Debrief (see "20" in Session 2)

14. Records (see "21" in Session 2)

15. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 10

A. Objectives

1. To introduce the students to exercises involving physical and pschological stress.

2. To practice and perfect skills learned in previous sessions.

B. Facilities: Swimming Pool _____

C. Equipment and materials: See Water Session 6

D. Outline of Instruction

1. Introduction

   a. Answer questions

   b. Take roll

   c. Announcements, if any

   d. Motivation

      (1) Training under ideal conditions

      (2) Physical and psychological stress during emergency

      (3) Behavioral response; prepare for reality, not simulation and pool practice

2. Designate equal size groups 1 and 2; for later exercise

3. Equipment selection and assembly; including buddy check

4. Entry of choice

5. Review; request assistance as needed

   a. Swimming without a mask

   b. Buddy breathing; with and without mask

   c. Buoyancy compensation

   d. Mask purging

6. Mask clearing circle exercise

   a. Assemble students in 2 equal size circles; deep water; direct by speaker; arms distance between

   b. On signal all remove mask and pass to right

   c. Purge mask; don't have to put on completely

INSTRUCTOR NOTES:

d. Pass to next person

e. Continue until you receive your own mask

7. Scuba circle: remove scuba and do the same as with mask

8. Scuba circle swim (time permitting)

a. Spread out around deep end of pool; one group in each half, equal space

b. Place scuba on bottom

c. Swim clockwise taking two breaths from each scuba

d. Replace your own scuba

9. Stress test: buddy breathe

a. Assemble students facing wall in deep water

b. Designate who will be donor or air supplier

c. Instruct them to raise to about 5 ft off the bottom and start kicking while pushing against the wall; insist on forcefull "all out" kicking

d. After one minute of "all out" kicking have them stop and immediately buddy breathe for one minute

10. Stress test: harassment

a. Swim with buddy; face bottom of pool

b. Assistants will, without warning:

(1) Flood mask

(2) Turn off air

(3) Change position of reserve lever

c. Students must "stay-on-the-bottom"

(1) Purge mask

(2) Signal buddy and buddy breathe if air is turned off

(3) Turn each others air on if both turned off at same time

(4) Resolve situation "on-the-bottom"

d. Instructors and aides must use discretion and caution

11. Persons may question this much work in a given session; this is "time-pressure" and "task-loading" for the student; at this stage of training we must be simulating stress

INSTRUCTOR NOTES:

12. Surface, remove scuba and place on side of pool
13. Review - practice
    a. Skin diver rescue
    b. Towing
    c. Rescue breathing in the water; deep and shallow
14. Supervised practice period; BC practice (time permitting)
15. Students disassemble and stow equipment
16. Post test requirements for next session on bulletin board
17. Summarize skills, stress, and performance for students
18. Debrief (See "20" in Session 2)
19. Records (See "21" in Session 2)
20. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 11

A. Objectives

1. To evaluate the students knowledge and skill in practical scuba diving exercises.

2. To establish if students are sufficiently skilled to advance to open water training.

3. To provide student with an opportunity to use specialized BC equipment, wet suits, etc.

B. Location: Swimming Pool _____

C. Equipment and materials: See Water Session 6

D. Outline for instruction

1. Introduction

a. Answer questions

b. Take roll

c. Announcements, if any

2. Expalin evaluation procedure

a. Four students will be assigned to one aide

b. Aide will use a check list to evaluate (See Appendix)

c. Instructors will roam from group to group to evaluate; aide will record instructor's comments

d. This is a complete exercise from the initial selection of equipment to the final washing of the equipment and placement back in the diving locker

e. Think before you act and work as a buddy team

f. This is a "continuous" exercise and should not be segmented

3. Evaluation; details on evaluation form; test on board

a. Select, assemble and check equipment

b. Buddy check; don all equipment

c. Stride entry using snorkel

d. Swim 100 yards on the surface while snorkel breathing

INSTRUCTOR NOTES:

e. Descend feet first; remove mask, slide over arm

f. Buddy breathe; 2 circles around deep end each providing air (total 4 circles)

g. Replace mask and purge

h. Adjust to neutral buoyancy with a 6 lb. weight belt and swim two circles of the deep end; deflate vest and remove belt prior to next exercise

i. Remove scuba at deep end wall; turn off

j. Controlled emergency swimming ascent for 25 yards (simulated, swimming along bottom of pool)

k. Rest no longer than 3 minutes

l. Submerge and swim 25 yards to scuba, turn on, resume breathing and don scuba

m. Proper deep water ascent

n. Inflate vest (oral)

o. Fin push 100 yards each

p. Swim 50 yards alternating between scuba and snorkel

q. Remove equipment in shallow end

r. Dissassemble, wash, and stow

s. Check with aide and instructor for debriefing and result.

4. Supervised practice period; special scuba with BCs available; students may reassemble their scuba after test completion (time permitting)

5. Complete records

6. Stow and secure personal equipment

INSTRUCTOR NOTES:

WATER SESSION 12

A. Objectives

1. To provide special aid to students who experienced difficulty on final skills test and to conduct make-up skills test.

2. To provide opportunities for additional practice, use of special equipment, and use of air inflated BC.

B. Location: Swimming Pool _____

C. Equipment and materials: See Water Session 9

D. Outline of instruction

1. Instructor assigns students to aides with specific instructions on individuals

2. Instructor evaluates individuals when aide calls for evaluation

3. Assign aides to special equipment

4. Records

5. Students disassemble and stow equipment; aide supervises

6. Instructor/aides stow and secure personal gear

7. All completed records to head instructor for entry into master roll book and file

INSTRUCTOR NOTES:

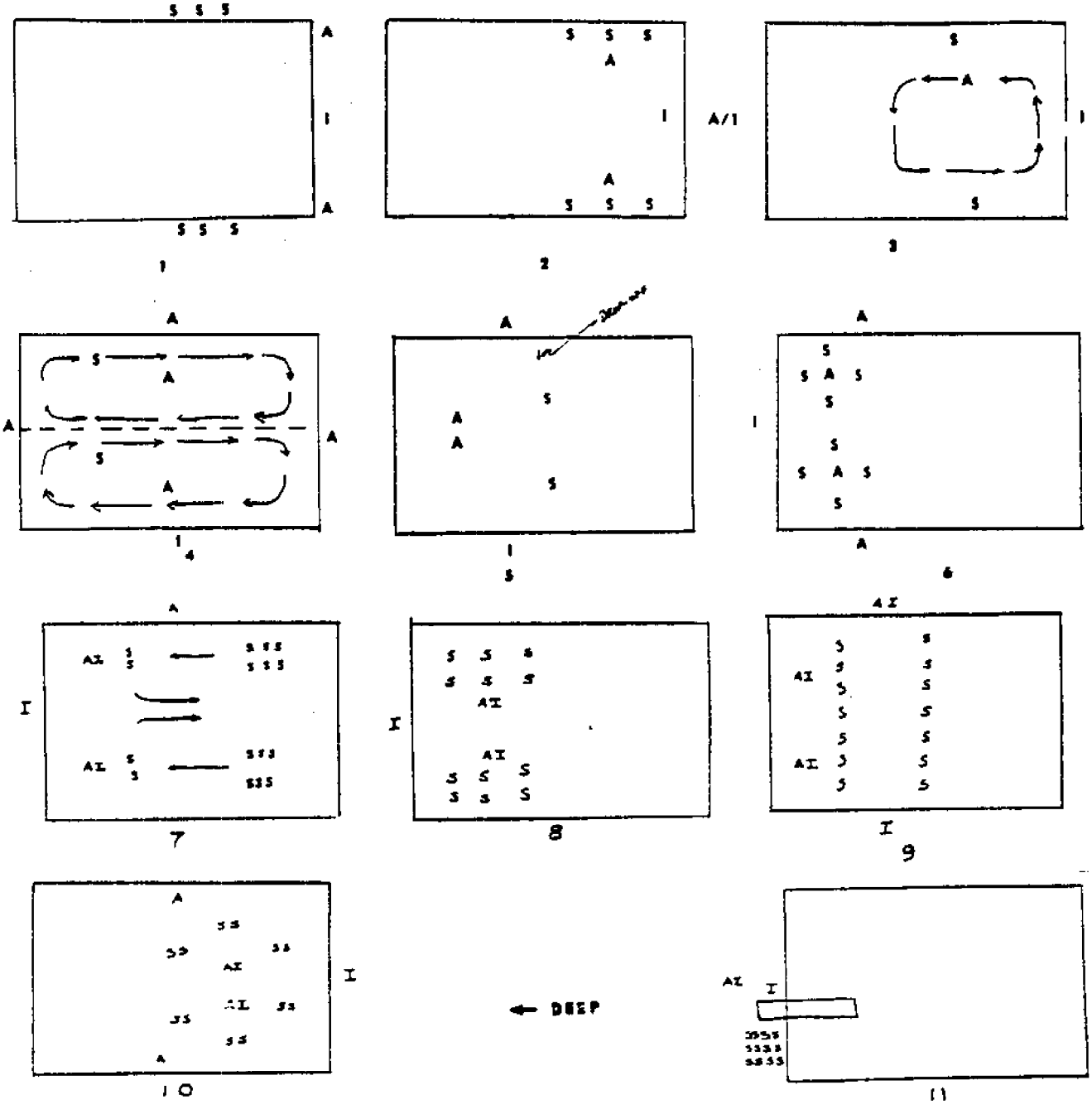
APPENDIX A

FORMATIONS

In order for all students to see and hear directions and demonstrations or to avoid confusion in practice of exercises the instructor must organize his class into formations or patterns. With experience each instructor will develop his own "technique" of class arrangement keeping in mind the basic elements of:

· Seeing · Hearing · Controlling · Safety

Several formations which include the placement of students (S), instructors (I), and aides/assistants (A) are given below to aid the novice instructor in developing the technique of class arrangement and control.



INSTRUCTOR NOTES:

APPENDIX B

ACCIDENT MANAGEMENT

Instructors must have an accident management plan for each teaching location. They must be prepared to handle any type of injury, both diving and non-diving related, in the pool, classroom, or openwater. Recommended procedures for managing accidents at the University of Michigan's Bell Pool are given below.

SCUBA DIVING ACCIDENT/AIR EMBOLISM PROBABLE

In this situation a student using scuba surfaces in distress or collapses (or develops serious symptoms) on the pool deck after leaving the water.

1. In water rescue or on deck assistance is provided by the nearest assistant, aide, lifeguard, instructor or student.

2. Immediately summon the head instructor.

3. If not breathing, start resuscitation (CPR) immediately.

4. If breathing and air embolism is suspected (symptoms/ accident circumstances):

   a. Place on 30^{o} incline (use backboard)

   b. Administer oxygen (diving locker)

   c. Continuous monitoring

5. An assistant will call the University Emergency No. 123. Give the following information:

   a. Drowning/scuba diving accident at Bell Pool.

   b. Physical education class/instructor's name.

   c. Request emergency medical assistance and ambulance.

   d. Request notification of UM Hospital Emergency Room that a drowning/scuba accident is being transported

6. An aide or assistant should immediately clear the pool and assemble class in an area away from the victim. The class is retained until dismissed by the instructor or a person from the PE office.

7. Contact University's Diving Medical Person:

   a. Call UM Medical Center Paging: 4-4244 and request emergency page for Dr. Nemiroff.

   b. State "Emergency: Scuba diving accident at Bell Pool, call 4-9450."

8. Send aide or responsible student to each entry door to direct emergency person (including loading dock door).

9. Notify PE office (4-3473) and Recreational Sports main office (3-3084).

10. Transport injured person to UM Hospital Emergency Room; Instructor or PE representative accompany. Be certain that a PE person is left in charge to resume class or dismiss class. If scuba diving instructor leaves, the class will be dismissed.

11. Chamber team will be contacted by instructor or physician if necessary. Assistants qualified as chamber operators should proceed to chamber on standby basis.

NEAR-DROWNING (NOT SCUBA DIVING)

In this situation a student is a victim of a near-drowning/diving board accident not involving the use of scuba.

1. Proceed as in the management of a scuba diving accident except:

   a. Use backboard for any diving board accident.

   b. Do not use words "scuba diving accident."

2. Dr. Nemiroff is still contacted on all near-drownings; however, the hospital generally will do this automatically.

3. If resuscitation is successful at pool side, the victim must be transported to the UM Medical Center Emergency Room for examination and treatment. Do not allow a resuscitated victim to leave without medical clearance.

4. In situations where a person has been rescued but resuscitation was not necessary, the instructor will have to make a judgement. Consider the following:

   a. Standard prevention measures for shock.

b. Advise person to go to UM Health Service if they start to feel "poorly" later in the day.

c. If the victim is obviously "ill or in very poor condition" (shock, etc.), consider transporting to Health Service or Medical Center as a precaution.

d. Call Dr. Nemiroff (use page service and request call back) or Health Service Physician for advise (4-8347).

e. Observe for adverse symptoms until end of class; do not force back into water.

f. Advise person not to be alone for next 6 hours and have them direct roommates to contact the 123 number (UM phones) or 911 number (non-UM phones) if the person looses consciousness or has adverse symptoms. Transport to Medical Center Emergency Room.

5. Do not leave victim unattended.

SCUBA DIVING/AIR EMBOLISM UNLIKELY

In this situation the victim was scuba diving; however, the circumstances of the accident suggest that an air embolism is unlikely.

1. If not breathing or unconscious, assume that an air embolism has occurred and handle accordingly.

2. If breathing, see No. 4 above.

POOL DECK ACCIDENT/ NOT WATER RELATED

In this situation the victim has been injured in a fall, exhibits symptoms of illness/drug usage, etc.

1. Summon instructor immediately.

2. Assistant takes charge of class; clear pool at instructor's request.

3. Administer standard first aid.

4. If apparently non-serious:

   a. Do not force the student back into activity.

   b. Advise student to go to UM Health Service for follow-up.

5. If serious and medical attention is required:

   a. Assistant call 123.

   b. Give Physical Education class and instructor.

   c. Give location (Bell Pool) and nature of accident.

   d. Request emergency aid/ambulance.

   e. Notify PE office (493473) and Recreational Sports main office (3-3084).

   f. Aide or student to doors to direct emergency personnel.

   g. If head or back injury, transport to UM Medical Center Emergency Room (anytime).

   h. If not head or back injury, transport to Health Service Emergency Room (9 AM - 4:30 PM) or UM Medical Center Emergency Room (after 4:30 PM, weekends, holidays).

IN ALL CASES, FILL OUT AN ACCIDENT REPORT AS SOON AS POSSIBLE. REPORT FORMS ARE IN INSTRUCTOR DESK DRAWER AT POOL.

APPENDIX C

SUGGESTED CONDUCT IN ACCIDENT SITUATIONS

Certainly no instructor wants to consider that an accident will cost the life of a student in his course. In general, we tend to "not think" about such things as an accident or a fatality associated with our courses. This is "negative thinking!" However, the knowledgeable and objective instructor must think about the potential of a fatal accident and be prepared to handle the situation. It is too late to give directions to your assistants and to figure out what to do yourself after the mishap has occurred.

Instructions for accident handling procedures are in Appendix B. The following is a recommended procedure in the event of a fatal or very serious accident:

1. Follow recommended procedures for first aid and general accident situation management.

2. Be certain that all other students, assistants, aides, and instructors are accounted for.

3. Have a trusted assistant isolate the class (non-participants in resuce and first aid) away from the scene. Do not let anyone leave until you have received authorization from the local law enforcement authorities.

4. Make every effort to avoid "newspaper reporters" and general public contact with the students and assistants. Ask the students and assistants to maintain a "no comment" attitude.

5. Do not give statements to the press or other individuals at the scene. If approached, simply indicate that information will be made available to the press through the University of Michigan Information Services Office; this is University policy. Be polite, but firm! Remember that any misquotation or undesirable statement made under stress can be printed and, later, may be used against you in a court of law. Diving fatalities seem to be "headline" news. These headlines damage you, the University, and the entire diving community.

6. You are required to provide law enforcement authorities only with facts. If the authorities attempt to interview you in public (in presence of unidentified strangers, by-standers, reporters, etc.) politely request that you

be allowed to make your statement in private. Give only facts such as your name, address, University affiliation, authorities to contact at the University, the exact location of the accident, a brief factual description of the occurrence (only if asked), the name of the victim, who to notify in case of accident, etc. If the interviewer attempts to force you beyond the basic "facts," request that University "legal counsel" be present during that portion of the interview. Avoid expressing opinions! Under stress it is easy to make irrational or undesirable statements. Avoid such statements as:

a. "His regulator must have failed!"

b. "If I had only been more watchful!"

c. "I was worried about that kid from the beginning!"

d. "He was our weakest swimmer!"

e. "It was all my fault!" (Do avoid this one regardless of how guilty you feel at the time.)

f. "The assistant blew it!"

g. "It must have been an air embolism!"

Simply think before you speak and don't trust anyone. The police reports are public information. Anything you say at the scene or even to the other students may later appear in print and be used against you in court.

7. Immediately prepare a complete and detailed written report for the University legal office, insurance office, PE Department, and other authorized persons who will be involved in your defense in the event of a law suit. This is a "confidential" report, not for public release. If the situation is "bad", do not give the report to anyone except the legal office which will be representing you. Use the accident report included in this guide as a model. The report should include photographs of the scene, sketch maps (accurate), weather conditions, water conditions, a detailed description of the activity being performed, your role, other persons involved, safety precautions, and anything, regardless of how minor it may seem, that relates to the scene, activity, diver, and your action.

8. Have each assistant and aide prepare detailed statements of facts. Do it the day of the accident, not a week later. These statements should be given only to the legal office.

9. If possible, have each student that was in attendance prepare a brief statement including name, address, their involvement (if any). Ask for facts as they recall them only. Do not attempt to "put words in their mouths!" Give these statements to the legal office.

10. Prepare a complete file on your course for the legal office including outlines, memos on procedures, records of all students for the term, etc. These will be valuable for future reference in the event of legal actions.

11. Complete the "Accident Report" form for the University.

12. Complete the "Accident Report" form for the University of Rhode Island project, but do not mail until approved by your attorney.

INSTRUCTOR NOTES:

APPENDIX D

POOL RULES AND REGULATIONS FOR BELL POOL

1. Swim only when a certified lifeguard in on duty and when the lifeguard has signaled that you may enter the pool.

2. All swimmers must take a soap shower before entering the pool.

3. Clean swimming apparel only is permitted. No cut-off, t-shirts, and jewelry are allowed in pool.

4. Walk at all times in locker and shower area, and on pool deck.

5. Personal flotation devices only, such as water wings, lifejackets, etc. may be used at the lifeguard's discretion when pool is not crowded.

6. Kickboards and pull-buoys are to be used only for working out.

7. No smoking, eating or drinking is permitted anywhere in the pool area.

8. Horseplay, dunking, tag games, etc. are prohibited.

9. All glass containers are prohibited anywhere in pool area with no exceptions.

10. No one is allowed on pool deck in shoes or sandals. Rubber thongs are acceptable.

11. Beginning swimmers are restricted to shallow end of pool.

12. When children 12 and under are allowed in the pool, they must be accompanied and supervised by an adult who is in the pool area with them at all times.

13. Children will be allowed to swim in lap lane at the lifeguard's discretion.

14. Children not toilet trained must wear tight fitting plastic pants along with a swim suit. No exceptions!

15. Clothing and valuables are not allowed in the pool area (Only items allowed are towels, soap, shampoo, etc.).

16. Divers may use the diving boards at the lifeguard's discretion. All diving has priority during designated diving times.

    Divers must:

    a. make sure area is clear before they dive.

    b. have one person on the board at a time.

    c. bounce only once on the board.

    d. dive or jump straight out, not to the side of the pool.

APPENDIX E

CHARGING SCUBA CYLINDERS

System: Stationary High Pressure Air Manifold

Location: Diving Locker, Room 118, Margaret Bell Pool

Approval: Underwriters Laboratories - Certified for operating pressures in excess of 3000 psi.

Authorization to Operate: Personnel using this manifold system must be instructed and authorized by the head instructor. Assistant Scuba instructors will be given special operation instructions. PE 111 students are not authorized to fill cylinders using the manifold system.

Charging Procedure:

1. Place Scuba cylinder(s) in water tank; close panel valve for unused filler lines.

2. Inspect cylinder valve orifice to insure that the o-ring is in place and that there is no water in or around the orifice. Replace o-ring, if necessary. Dry orifice area with towel and/or slightly open cylinder valve to blow water from the orifice. IMPORTANT: No water must enter Scuba cylinder during charging procedure.

3. Master manifold system valve "OPEN" (open: counter clockwise; close: clockwise). This valve will generally remain open at all times.

4. Put reserve lever in DOWN position. IMPORTANT: Scuba cylinder will not fill unless the reserve lever is in down or on position.

5. Connect filler yoke(s) to cylinder valve(s) in the same manner as placing a regulator on a cylinder valve. Be certain that the filler is seated properly and securely (thumb tight, don't force).

6. Close panel bleeder-valve on filler yoke assembly.

7. Open panel filler valve.

8. Open (counter0clockwise) Scuba cylinder valve.

9. Check manifold system pressure gauge. This will indicate the Scuba cylinder pressure.

10. If the Scuba cylinder pressure is less than 300 psi, open the valve on storage cylinder "1". Cylinder "1" will always be designated by "1" written on the cylinder with chalk or by a No. 1 tag. Allow the pressure between storage cylinder "1" and the Scuba cylinder to equalize. The sound of air passing through the line will indicate that the Scuba cylinder is being charged. When the sound stops, the pressure is equalized.

    If the Scuba cylinder pressure is greater than 300 psi, it will be necessary to start charging procedure with a storage cylinder pressure slightly higher than the Scuba cylinder. If you do not know the pressures of the respective storage cylinders from previous chargings, you must determine which cylinder to start with as follows:

    a. Close the panel filler valve.

    b. Progressively open storage cylinder valves (counter-clockwise), ONE AT A TIME, until the desirable pressure is indicated. IMPORTANT: Never have more than one storage cylinder valve open at a time. Always close the previous cylinder valve before opening the next.

    c. Open the panel filler valve.

    d. Equalize pressure between storage cylinder and Scuba cylinder as above.

11. When pressure has equalized, close (clockwise) the storage cylinder valve.

12. Repeat equalization procedure by opening the next storage cylinder valve to the right (as you face the air manifold system).

13. Repeat operating, progressing to the right until the Scuba cylinder pressure is 1500 to 2000 psi. Normally, do not fill beyond 500 psi for training purposes.

14. When the last bottle in the line, at far (right-hand) end of system is reached, progress to the left cylinder, closest to the master valve, and then work to the right.

15. Close last storage cylinder valve.

16. Close filler yoke valve and Scuba cylinder valve.

17. Open bleeder-valve.

18. Remove filler yoke assembly and secure on bracket. IMPORTANT: Never let the filler yoke assembly drop underwater when not attached to a Scuba cylinder. No water should enter this assembly. If the assembly is dropped into the water tank, flow high pressure air through the assembly for 1 minute before placing it on a Scuba cylinder.

19. Remove Scuba cylinder(s) from water and repeat operation until all cylinders are filled.

20. Securing charging operations:

    a. Secure filler yoke assembly in bracket.

    b. Close all storage cylinder valves.

    c. Drain air from manifold system by opening the filler yoke assembly valve.

    d. Close filler yoke assembly valve (to keep out excess moisture from atmosphere).

Replacing Storage Cylinders:

When the storage cylinder pressure drops to 200 to 300 psi, the cylinder must be replaced.

1. Close all storage cylinder valves.

2. Open master valve and filler valve. Let all air drain from manifold.

3. With hand, never use a wrench, remove fitting from storage cylinder valve.

4. Place protective cap over storage cylinder valve.

5. Release chain and remove storage cylinder.

6. Mark "EMPTY" on cylinder tag with red marker.

7. Transport to loading dock area using two-wheel carrier from basement. Handle with care! Place in area marked EMPTY.

8. Transport a full cylinder from loading dock area. IMPORTANT: Handle with care!

9. Slide full cylinder into place, remove protective cap, aline, and secure with chain.

10. Connect fitting to cylinder valve. Do not force. If the fitting will not screw into the valve easily, replace cylinder. IMPORTANT: Do not force these high pressure fittings and never use a wrench. Label discarded bottle as "FULL - BAD FITTING."

11. Periodic replacement of teflon seal rings on manifold connectors is necessary; see head instructor.

Safety Precautions and General Information:

1. Never let untrained personnel charge Scuba cylinders.

2. Handle all high pressure cylinders with extreme caution. Never drop or strike.

3. Never exert extreme force on these high pressure fittings. A wrench need never be used.

4. If a malfunction is suspected, contact the head instructor. Do not attempt repair. Report any abnormality to the head instructor.

5. Close all valves tightly, but do not exert extreme force on them.

APPENDIX F

INSTRUCTOR PREPARATION COURSE DESCRIPTIONS

INSTRUCTOR NOTES:

DEPARTMENT OF PHYSICAL EDUCATION
THE UNIVERSITY OF MICHIGAN

SCUBA INSTRUCTOR AIDE (PE 115)

GENERAL INFORMATION

This course is for both the novice and experienced scuba diver who is interested in preparing for instructor certification examinations. The student is provided an opportunity to gain practical experience in teaching selected aspects of skin and scuba diving under the direct supervision of an instructor. Most teaching situations will be on a one-on-one basis for special help or absence make-up. The student will also aid the instructor in demonstrations, act as a lifeguard in scuba classes, aid with open water dives, and assist in filling scuba cylinders, maintaining equipment, and recordkeeping. Students will be required to attend and assist in at least one basic scuba pool session (PE 111) per week. The various tasks assigned by the instructor are designed to enhance safety in PE 111 and to provide insight into the various requirements and responsibilities of the scuba instructor. Persons not previously attending PE 111 classes are encouraged to attend PE 111 lectures on Mondays, 7-9 pm at 1024 E. Engineering. Persons attending the PE 111 sessions will also assist in slide projection, grading examinations, aiding students with problems, etc. This is a "learn by observation and participation course". Extensive prior diving experience is not required. Enrollment is limited to three aides per PE 111 session or a total of 15; all positions are assigned on a "first come" basis.

Prerequisites

Physical Education 111 or equivalent.

Textbook

Somers, L., Research Diver's Manual, MICHU-SG-71-212 (Ann Arbor: University of Michigan Press, 1972).

Although specific reading assignments will not be made in the textbook, all students are expected to be familiar with all aspects of basic scuba. Special handouts will be distributed to aid students in preparation for each pool session.

Fees and Cost

Pool fees for semester: $_____

Your class assignment: Day _____ Time _____ Section_____

Instructor: Lee H. Somers, Ph.D.
Office: 1271A CCR
Telephone: 764-4472
Hours: _____

DEPARTMENT OF PHYSICAL EDUCATION
THE UNIVERSITY OF MICHIGAN

SCUBA INSTRUCTOR: PRACTICE TEACHING (PE 116)

GENERAL INFORMATION

This course is for experienced divers who have completed a basic scuba course (PE 111), the scuba instructor aide course (PE 115) and the scuba instructor theory course (PE 114) or their equivalents. The student will be assigned practice teaching responsibilities in a basic scuba course (PE 111). A maximum of two practice teachers will be assigned to each PE 111 pool session at the discretion of the instructor. They will "team teach" selected portions of the course under the direct supervision of the course instructor and assist on open water training dives. Students will also be expected to prepare and present basic scuba course lectures in PE 111 make-up sessions or at special "lecture-learning" sessions.

Prerequisites

Physical Education 111 or equivalent
Physical Education 114 (Recommended but not required)
Physical Education 115 or equivalent
Other recommended but not required courses:
CPR: Basic or Instructor (MHA, ARC or equivalent)
First Aid (ARC Advanced or equivalent)
Senior Lifesaving (ARC, YMCA or equivalent)
PE 117: Hyperbaric Chamber Attendant

Textbook

Special handouts will be distributed to aid students in preparation for each pool session.

Your class assignment:

Day _____ Hour _____ Section _____

Instructor: Lee H. Somers, Ph.D.
Office: 1271A CCRB
Telephone: 764-4472
Hours: _____

APPENDIX G

FORMS

INSTRUCTOR NOTES:

WATERMANSHIP-FITNESS EVALUATION Course _____ Sect. _____ Date _____

NAME	REGISTERED	400 YD. SWIM (TIME)	25 YD. U/W SWIM	15 MIN. SURVIVAL SWIM	RECOVERY & TOW (25 YD)		RELEASE SIGNED	MEDICAL ASSESSMENT	ATTEND LECTURE I	ATTEND POOL I	ACCEPT (A)/ REJECT (RJ)	COMMENTS
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												
11.												
12.												
13.												
14.												
15.												
16.												
17.												
18.												
19.												
20.												
21.												
22.												

WATERMANSHIP-FITNESS EVALUATIONS

P: Pass

F: Fail

RT: Retest

Inst. _____

INSTRUCTOR NOTES:

Section _____ Term _____

SCUBA DIVER TRAINING
SKILL PRACTICE FREQUENCY ANALYSIS

SKILL	PRACTICE FREQUENCY PER SESSION											
	1	2	3	4	5	6	7	8	9	10	11	12
Don/Adjust M,F,S												
Buddy Check: Skin												
Surface BC Inflate												
Kick												
Snorkel Purge												
Discard Weight Belt												
Recover Sub. Skin Diver												
Lifesaving Approach												
Lifesaving Carry/Tow												
Lifesaving Release												
Surface Dive												
Fin Swimming Exercises												
Assemble/Don Scuba												
Buddy Check: Scuba												
Underwater Swim: Scuba												
Purge Mask												
Purge Regulator												
U/W Doff-Don												
Surface Doff-Don												
BC: Scuba												
Control Descent												
Control (Normal) Ascent												
Emergency Ascent												
Surface Swim: Scuba												
Buddy Breathe												
Recover Sub. Scuba Div.												
In-Water AR												
Stride Entry												
Back Entry												
Ladder Exit												
Deep Water Exit												
U/W Swim w/o Mask												

COMMENTS:

INSTRUCTOR NOTES:

MIDTERM SKIN & SCUBA DIVING SKILL EVALUATION

SECTION _____

TERM _____

DATE _____

NAME	Skin Diving							SCUBA								Lifesaving					Pass-Fail	Comments
	Stride Entry	400 yd. Swim	Head First S.D.	U/W Swim:	Fatigue Swim			Equipment Assembly	Buddy Check	Stride Entry	Purge Mask	Purge Scuba	Buoyancy Comp.	Emergency Ascent		Fatigued-Swimmer	Rescue-Tow	Recover Scuba Div.	In-Water AR			

REMARKS (Use other side if necessary):

_____
Instructor's Signature

INSTRUCTOR NOTES:

POOL TRAINING SCUBA DIVING SKILLS: FINAL EVALUATION

SECTION _____

TERM _____

DATE _____

P: Pass
V: Pass
F: Fail
R: Repeat

NAME	I.D. Number	Buddy Selection	Assemble Scuba	Pre-Dive Check	Entry:	Surface Swim:	Buddy Breathe	Buddy Breathe w/o Mask	Purge Mask	Doff Scuba	Emergency Ascent	Purge Regulator	Don Scuba	Buoyancy Comp.	Diver Rescue	Diver Tow	In Water AR	Exit: Deep Water	Disassemble/ Stow			Pass/Fail	COMMENT

REMARKS (Use other side if necessary):

_____
Instructor's Signature

INSTRUCTOR NOTES:

THE UNIVERSITY OF MICHIGAN
ANN ARBOR

TO: Students enrolled in PE 115,116

FROM: Lee H. Somers

The following must be completed by the end of the first full week of school:

____ 1. Approval of instructor.

____ 2. Complete enrollment (Elective Course registration desk in upper level hall of CCRB.)

____ 3. Give class card to instructor.

____ 4. Complete "Application Form", "Release Form", and "Medical Form."

____ 5. Select PE 111 teaching session .

____ 6. Submit copy of most recent medical examination (recommended but optional unless specifically requested).

____ 7. Submit copy of scuba diver, first aid, lifesaving, CPR certificates (duplicating machines in library).

____ 8. Pick up schedules and teaching material/manual (may be distributed by your critic instructor in pool session).

INSTRUCTOR NOTES:

APPENDIX H

SKILL ENHANCEMENT GAMES*

Games and contests can be used to enhance skill development, fitness, and confidence. On the other hand, such activities can not be a substitute for organized teaching-learning activities. Games and contests can be used for review, reward, end of the session practice, or simple enjoyment. Competitive activities must be used with discretion and caution. The spirit of competition and desire to win can overshadow recall of basic safety procedures. For example, never conduct a "timed" or "head-to-head" competition event using scuba that requires the person(s) to finish at the surface. Several cases of pulmonary barotrauma have resulted from rapid breathhold ascents at the end of the competitive event. The desire to win is a dominant human characteristic, even more important than personal safety to some individuals. All activities must be carefully supervised. For example, skin diving games requiring extended periods of breath-holding can lead to shallow water blackout and, subsequently, near drowning. Safety divers must always be used during such activities. A game or contest used properly enhances learning. A game or contest used improperly is a hazard.

SKIN DIVING GAMES AND CONTESTS

Mask Scramble

1. Collect all masks.
2. Students line up on side of pool.
3. Instructor throws all masks into pool.
4. Students make entry and each recovers a mask on the bottom.
5. The student must purge the mask before surfacing.
6. Variation: The masks (less one mask than the number of students) are tossed into the pool. The student not retrieving a mask is eliminated. Repeat as desired until several or all but one student is eliminated.

---

* Modified in part from Underwater Instructor's Manual, County of Los Angeles, Department of Parks and Recreation (Out of print/no date of publication).

Buddy Swap

Buddies swap each piece of equipment (mask, fins, snorkel) while underwater. Purge mask underwater and snorkel upon surfacing.

Fin Recovery

Fins are thrown into water and students put on in water. Variation: Masks and snorkels can be included.

Race for Life

1. A two-person team swims to a panicked or disabled (unconscious) skin diver.

2. Orally inflate vest and tow to finish line.

3. Timed or multiple team competition.

Follow the Leader

Select top student or assistant instructor and have him/her set the pace around the pool, performing skills learned.

Scavenger Hunt

This is a better ocean or lake routine, but sometimes a pool yields a collection of objects (hair pins, band aids, ear rings, etc.) It's a good way to clean the pool bottom. Winner gets a booby prize as Champ Scavenger.

Communications

One student starts a hand signal message under water down a line. The last man surfaces and checks the message with the lead-off man. (Similar to party game whisper,) Loser could be required to carry out action of message.

Underwater Golf Course

If you're ambitious, a par golf course can be set up on the bottom with instructions on weighted slates, such as:

"Hole 1" - Switch masks.

2 - Switch fins.

3 - Switch snorkels.

4 - Solve math problem (2 x 2 = 4) on slate.

5 - Screw nut onto bolt.

6 - Put nail puzzle together.

7 - Put 3 piece jig saw puzzle together.

8 - Solve plastic steel marble puzzle.

9 - String beads.

10 - Untie a knot.

11 - Recover an object.

12 - Breathe from a SCUBA unit.

13 - Write name on slate.

14 - Blow up balloon.

15 - Recover red disks.

16 - Wind clock (in plastic bag).

17 - Tie square knot.

18 - Swim 50 feet under water.

Winner gets a golf ball coated with sand, mounted on a piece of wood.

Capture the Flag

This takes two teams, each protecting a plastic flag. Anyone crossing center line into enemy camp can be captured and placed in prison area. Prisoners are released by being tagged by team mate. An inner tube can be substituted for the flag. Can also be a scuba diving game played on the bottom.

Dolphin Kick Relay

This relay is done only with the Dolphin leg kick. It can be done with any number of students and is an excellent conditioner for large muscles and wind. Contestants should dive in from edge of the pool when tagged.

Penny Hunt

Any number of pennies must be placed anywhere on the bottom of a pool. The student with the most pennies wins. Let them keep the pennies.

Clearing Mask Contest

Each individual places his mask halfway across the pool and returns to the edge. On a given signal each swims under water, wearing fins, and recovers and clears mask. Each must surface facing judge with mask free of water. The first one facing judge with a cleared mask wins.

Race with Fins

Contestants line up at end of pool and dive in at a given signal. The first to reach the other end or completed distance wins.

Underwater Football

Both sides line up facing each other in shoulder-high water. The football consists of a tennis ball tied in a sock. Goals are set and you can use as manny first down lines as needed for your group. This game is never played in deep water. One side throws the football to the other. At this time, both teams duck under water and the player with the ball attempts to reach the goal line of the other team without coming up for air. When any team member of either side breaks the top of the water with his head, he is out of that play. Standard football rules apply.

Disc Addition

1. Obtain twenty discs that will sink, about 1½ inch in diameter. Paint them white and number them in two sets from one to ten.

2. The instructor throws both sets of discs into the pool and gives the student a number.

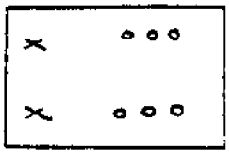
3. The student then dives to the bottom (with mask, fins, and weight belt only) and picks up the discs that total the number he was given . . . then checks back with instructor on his time.

   OBJECT: This exercise teaches breath control, quick thinking under water so that the mechanics of swimming become second nature.

SCUBA DIVING GAMES AND CONTESTS

Relay Race

1. Two teams (fully equipped) line up as shown in the diagram below, with two lone divers taking the "X" positions.



2. First man in line swims down to "X" and assumes correct position for buddy breathing, clears regulator, takes two breaths, and then assumes position of "X" who swims back to line.

3. Former diver in "X" position taps first man waiting in line then swims back to the end of the line and continues until first "X" diver is back in his original position.

An Exercise in Treading Water

1. Have class not on units (a little heavy if possible) enter water.

2. Without using scuba or snorkel have them tread water for five minutes.

3. Kick off fins and tread water for three additional minutes.

Group Exercise To Develop Confidence in Case of Lost Equipment

1. Have group swim with unit on, but without fins.

2. Have group swim with unit on, but without mask and snorkel.

3. Have group tow unit on the surface of water.

Position Breathing

Have the group assume various positions while utilizing the scuba unit.

1. Head down to bottom standing upright.

2. Rolling to each side.

3. Swimming on back.

4. Normal swimming position on stomach.

5. Head in water, unit out.

6. Unit in water, head out.

Underwater Tag

1. Wearing scuba equipment and fins the group stays underwater without masks.

2. The diver that is "IT" wears a mask which he passes to the diver he tags. The mask identifies the person as the one to stay away from.

Underwater Hand Signals

1. Line up five to ten people in front of one another. The instructor give the first man in the line a series of hand signals.

2. First diver in line turns and passes the signals to the next in line and so on down to the last man.

3. The instructor has stationed himself at the end of the line and is the last man to receive the message to see if it is the same as he sent it.

Underwater Hand Signal Quiz

1. Instructor assembles students in semi-circle formation in deep end of pool.

2. Each student is provided with a slate and pencil; number answer spaces 1 - 10.

3. Instructor, using key slate, presents hand signals.

4. Students record meaning of signal on slate.

5. Grade as a group exercise after surfacing.

Air Stations

1. Set up stations consisting of different types of units and masks at various locations in the pool.

2. Participant swims to each station and renews his supply of air. He also switches masks at this time.

3. Diver clears mask.

4. Diver then swims on to another unit.

5. Exercise can be done with scuba only (no mask clearing).

Switch

1. Divers enter water with buddys.

2. At the signal divers go underwater and switch all equipment with buddy.

3. Instructor acts as observer and timer underwater.

Team Spirit

1. Diver removes unit with aid from buddy.
2. Divers surface and exchange masks.
3. First diver puts on unit then assists buddy in removing his unit.
4. Divers surface and again exchange masks.
5. Second diver (with aid from his diving buddy) puts on his unit.
6. Divers surface and raise hands to check with instructor.

Neutral Buoyancy (An exercise for divers in adjusting weights.)

1. Fully equipped diver should cruise to the deep end of the pool and experiment with his weights until he/she can control position at any depth without exertion.
2. Diver should remove or add weights while holding weight belt in hand.
3. After each addition or removal of weights diver should swim a short distance to test his control.
4. The diver should then remove his unit, place it in front of him/her (retaining mouthpiece) and straddle the unit.
5. If diver has achieved neutral buoyancy he will rise several inches with each inhalation and sink several inches with each exhalation.

Instructor Notes:

APPENDIX I

UNIVERSITY OF MICHIGAN

DEPARTMENT OF RECREATIONAL SPORTS

AND

DEPARTMENT OF PHYSICAL EDUCATION

PERSONAL INJURY EMERGENCY PROCEDURE

AND

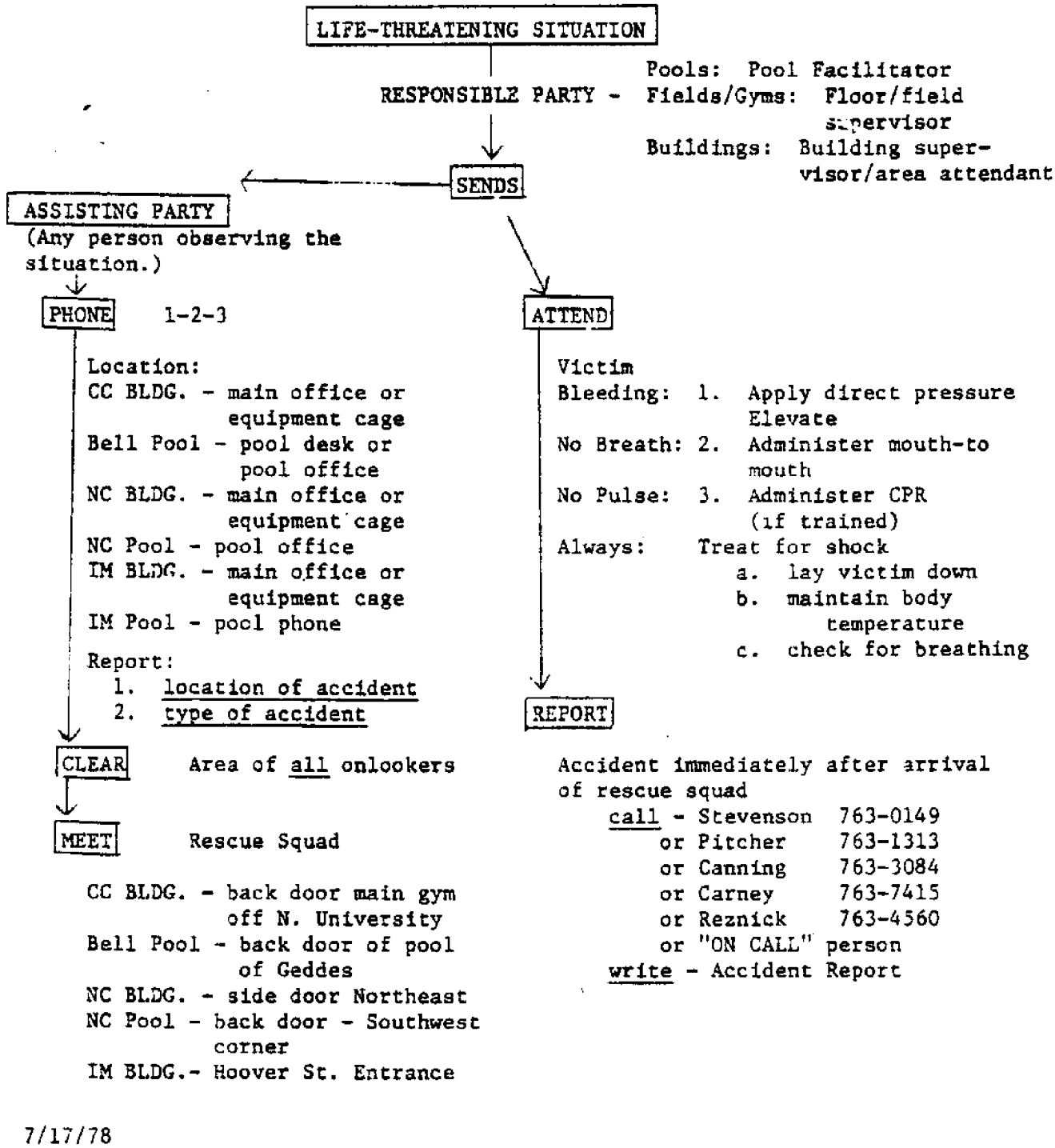
STUDENT ACCIDENT REPORT FORM

Instructor Notes:

University of Michigan

Department of Recreational Sports

PERSONAL INJURY EMERGENCY PROCEDURE



7/17/78

The University of Michigan
Physical Education

STUDENT ACCIDENT REPORT FORM

1. Name of Injured _____ Address _____

2. Time of accident: ____a.m. ____p.m. Date _____

3. Location of Accident:
   Athletic Field ____
   Classroom ____
   Corridor ____
   Gymnasium ____
   Locker Room ____
   Pool ____
   Shower Room ____
   Stairs ____
   Other (specify) ____

DESCRIPTION OF ACCIDENT
How did accident happen? What was student doing? List specifically any unsafe acts or unsafe conditions existing at time of accident. Specify any equipment involved. Please be specific.

4. Nature of Injury:
   Abrasion ____
   Bruise ____
   Burn ____
   Concussion ____
   Cut ____
   Dislocation ____
   Fracture ____
   Shock ____
   Sprain ____
   Other (specify)

5. Part of Body Injured _____

6. Degree of Injury: Non--disabling ____ Temporary Disability ____

7. Instructor in charge when accident occurred _____
   Was he present at scene of accident: Yes ____ No ____

8. Immediate Action Taken:
   First Aid Treatment (Nature of) _____
   _____ By Whom _____
   Physician summoned (name) _____ By Whom _____
   Sent to Health Service _____ By Whom _____
   Sent to Physician (name) _____ By Whom _____
   Sent to Residence _____ By Whom _____
   Taken to Residence _____ By Whom _____

9. Witness to Accident:
   Name _____ Address _____
   Name _____ Address _____

10. Do you have any recommendations for preventing such accidents?

_____ _____
Instructor Reporting Accident Date of Report

INSTRUCTOR NOTES: