

6AULT COLLEGE
of Applied Arts and Technology
Sault Ste. Marie

COURSE OUTLINE

Recreation & Physical Training

REC.100-1
110-1
200-1
210-1

revised June, 1979

To date, three separate programs of fitness testing, as well as, intramural and special tournaments have been developed to most suit the needs of the students, staff and College. A complete explanation will accompany all three specific programs of fitness testing to enable proper evaluation of said programs.

FITNESS PROGRAM I

This program was originated and designed to give an overall view of the test subject's personal fitness level. The test includes: heart rate evaluation, blood pressure reading, anthropometric measurements, body fat count, strength of upper body, vital capacity measurements, cardiovascular, cardiopulmonary exercise responses and muscular endurance.

Test I - Program I

This is a measurement of all anthropometric regions of the body to allow for the charting of all changes which occur due to the personal program which is worked out for the subject. These measurements are then recorded on Form A-1 and Booklet A to be used at a later date for fitness evaluation.

Test II - Program I

This is the measurement of the amount of fat you have on your skeletal frame. The instrument of measurement used in this test is the Harpenden skinfold calipers.

The procedure of this test is as follows: skinfold measurements are taken at the following areas - subscapular, supriliac crest, medial bicep, medial tricep, one inch superior and medial to right nipple (male) and medial superior thigh (female). The total skinfold measurements are then added up to determine the total millimeters of body fat the subject is carrying. By referring to Form B

this total can be converted into a percent fat of body weight. Then you refer to Booklet A to determine the ideal percent of body fat the subject should be carrying and subtract the ideal percent from the actual percent to determine exactly how much fat the subject must lose or gain to obtain his/her ideal weight. These figures are then recorded and analyzed, and then placed on Form A-1 and Booklet A. By referring to Form C, you can determine which level of fitness you are at according to your body fat.

Test III Program I

This is the test of measurement of the subject's systolic and diastolic blood pressure. The instruments involved are the sphygmomanometer, blood pressure cuff, and stethoscope. -Placing the cuff between the proximal and distal portions of the upper arm and placing the stethoscope at the distal and medial point of the bice and reading the sphygmomanometer gauge, the systolic and diastolic pressure can be determined. These figures are also recorded for analyzation on Form A-1 and Booklet A.

Test IV Program I

This test is for strength index, and is measured with the hand grip dynmometer. This instrument measures the amount of strength found in the upper body. The subject stands with his/her feet shoulder width apart, holding the dynmometer straight armed in front of him/herself. By squeezing the instrument's handle, and simutaneously drawing the dynmometer towards the side of the body until the subject can squeeze no longer, the total upper body strength can be measured. This must be completed with both sides of the body. These figures measured in kilo-pounds are then registered on Form A-1 and Booklet A. By referring to Form D, the subject's results are analyzed and recorded in Booklet A, page 7.

Test V Program I

This test is for flexibility; the extent or degree that a person can achieve when moving at any particular joint is flexi-

bility. It begins to decrease at the ages of 24 - 25 years if both strength and stretching exercises are not done. This test is performed on the flexometer bench with legs extended. Without bending his/her knees and without using forward momentum, he/she slowly reaches forward with extended arms and fingers in an attempt to project his/her fingertips as close or past the toes as possible. The subject slides the marker forward along the self in which the embedded ruler marker is placed. The distance is then recorded on Form A-1 and Booklet A. The results are computed from Forms E and F and the results are completed and filled out on Booklet A, pg. 7.

Test VI Program I

Vital Capacity is the total amount of air that can be expelled from the lungs after you have taken as much air as possible. The instrument of measurement is the spirometer. The subject inhales, holds his/her nose, and blows as hard and as fast as possible until total air is expired, into the spirometer; the figures obtained are recorded on Form A-1 and Booklet A. The predicted maximal oxygen uptake is determined from the predicted vital capacity norms, Form G. To discover the percentage of vital capacity or the efficiency of lung usage, the actual vital capacity is subtracted from the predicted vital capacity. The difference between the predicted and the actual vital capacity is then converted to percentage of vital capacity by Forms H and I. This percentage is then recorded on Form A-1. The evaluation mark of the percentage vital capacity is computed from Form J and recorded on page 7 of Booklet A.

Test VII Program I

Cardiovascular fitness is the most important aspect in total physical fitness.

The equipment needed to perform this test are: variable speed and elevation treadmill, workload ergometer, heart rate monitor, metronom, pedal revolution totalizer, interval timer, and stethoscope.

Type of Exercise

Large muscle groups must be engaged if a work test is centered upon an analysis of oxygen transportation function. At submaximal work levels, the work time should be at least six minutes long, so that the respiration and circulation have time to adapt. At that time, a steady state or second wind occurs, that is to say the rate of oxygen uptake in the lungs corresponds to the tissue oxygen demands. The steady state concept implies that such easily measured functions as heart rate and pulmonary functions have attained stability. It is advantageous if the absolute work load can be widely varied so that the subject with different capabilities can have approximately the same relative work load. If the work is too light, for example, 100 to 120 beats per minute, psychological factors such as nervousness can influence the pulse of reaction. If work is too heavy, a strain is placed upon the subject's desire to co-operate, and overloading also implies the certain risk.

Bicycling and treadmilling have proved to be very suitable work forms since among other things, the given workload, being submaximal, it demands the same energy output whether the subject be young or old, trained or out of condition, elite bicyclists or unfamiliar with the sport. The bicycle ergometer and variable speed tread mill were invented several decades ago, and have been widely used in psychological laboratories ever since. These instruments provide an exact measurement of the performed external work and thus a graded and measurable load can be applied to the subject.

Setting of Load

The bicycle ergometer should stand on a level, firm foundation. With the subject mounted, but not touching the pedals, adjust the zero mark on the scale B with the screw E so that it coincides with the mark on the pendulum weight. This setting must be accurate if the load is to be precisely set.

Work is started with a slack belt. Thereafter, the belt should be stretched with the aid of the hand until the required

work load is obtained, one kilopound equals 300 kilopounds per minute, 2 kilopounds equals 600 kilopounds per minute, 3 kilopounds equals 900 kilopounds per minute, and so on, provided that the pedal frequency is 50 turns per minute. Start, or read off the work time clock. If the belt and the wheel get warmed up, the friction will change, necessitating re-adjustment, especially if the apparatus has been unused for any length of time. Check the load at least once every minute.

Procedure of the Work Test

Energetic body activities should not be engaged during the hours preceding the work test, nor should the test be performed earlier than about an hour after a light meal or after a longer time if the heavier meal has been taken. Furthermore, the subject should not smoke for at least 30 minutes prior to the commencement of the test.

Experience shows that the basal resting heart rate does not normally give any normal information over and above that providing the work test. The available time will thus have to help the operator to decide whether the test is preceded by resting in a reclining or sitting position.

Adjust the saddle and handlebars to suit the subject. Studies have shown that mechanical efficiency expenditure of energy as is called, does not vary to height of the handlebar or the saddle providing that it is kept within a reasonable limit. The most comfortable position, and in the case of very heavy work, the most effective one, is the saddle height that, when the subject has the front part of his foot on the pedal, gives a light bend in the knee joint in the lower position.

Provided that the work is not too heavy, respiration and circulation increase during the first few minutes and then attain a steady state. This increase in heart rate can be established by counting the heart rate every one minute. After six minutes, the heart rate is taken and has generally reached a steady state.

Choice of Workload

Trained, or active sportsmen, the risk of strain in connection with work test is very slight. For female subjects, a suitable load is 300 kilopounds per minute. For male subject, 600 kilipounds per minute is effective. If the heart rate exceeds about 130 beats per minute, the load can be considered adequate and the test discontinued after six minutes. If the heart rate is lower than 130 beats per minute, the load should be increased after six minutes by 300 kilopounds.

For persons expected to have lower physical work capabilities, for instance untrained or older individuals, or delicate persons, smaller loads should be chosen and initial intensity of 300 kilopounds per minute will be suitable. If a physician is not present, work tests on persons over 40 years of age should be discontinued if the heart rate exceeds 150 beats per minute, and the load should not be raised over 600 kilopounds per minute. For female subjects, 900 kilopounds per minute and for male subject, 3 kilopounds respectively.

If the subject experiences pressure or pain in the chest, pain radiation into the left arm and or jaw or intense stitching or troublesome shortness of breath, the test must be discontinued.

Recording and Analyzation

After the heart rates have been taken at the last 10 seconds of each 6 minute interval, they are then recorded on Form A-1 and Booklet A. The recovery heart rate is then taken at the last 10 seconds of each minute for the next six minutes and are recorded on Form A-1.

To analyze this data and discover the level of cardiovascular fitness, the last heart rate of the first six minutes is looked up on Form K under the correct and corresponding work load. This figure is then multiplied times the age correction factor found on Form L. This figure is now the calculation of the maximum oxygen uptake in the litres per minute. To determine the actual maximum

oxygen uptake or cardiovascular fitness in ml/kg/min, you must refer to Form M. By finding the subject's body weight and corresponding it with the oxygen uptake in litres per minute, you will discover the actual cardiovascular fitness level of the subject.

After you have discovered the actual VO in ml/kg/min, you refer to Form N to determine the subject's rating of fitness. This figure is then transported and recorded on Form A-1 and Booklet A, page 7.

Test VIII Program I

This is a test of muscular endurance. The apparatus needed for this test is a padded floor mat, stop-watch, and a willing subject. The subject is required to do as many speed-bent knee sit-ups as possible (with both hands behind the head) in one minute. This number is then recorded on Form A-1 and Booklet A, page 8. To assess the subject's level of fitness endurance according to his age group, the figure obtained must be determined from Form 0 and Form P. This level figure is then recorded on Booklet A, page 7.

FITNESS PROGRAM 2

Test I, II, and III

The reason for this program is two fold. This program was designed to give the necessary data required to assess the two major area's of physical fitness (cardiovascular and percentage of body fat). This program was also designed as a time saver. With this specific program, both major area's of fitness can be tested to give a relatively accurate reading as to the subject's general fitness level and to be completed in a relatively short period of time (1 half hour).

This test is for cardiovascular fitness and is performed and analyzed in the same manner as Test VII in Program I.

The recording of the data however is placed on Form A-2; Form A-2 is the subject's general personal data: height, weight, date of birth, name, blood pressure, heart rate, and workload of tes

The subject's blood pressure is measured the same as in Test III Program I, and with the same instruments.

The third test is the test to determine the percent of body fat the subject is carrying. This test is carried out and analyzed in the same manner as Test II Program I, but the results are recorded on Form A-2.

This program is not as accurate as Program I, but it does save time for the subject who can only give up one-half hour of his/her time. The drawback with this program, however, is that an assessment of the subject's strength, flexibility, vital capacity, and endurance can only be made by an educated guess!

FITNESS PROGRAM T T T

This program was developed for the children of any staff or students. With an example from the children, it is hoped that the parents will follow suit.

This program is a motor fitness test and can be performed at home or outside (in the summer). The program is designed so that the parent can record and analyze the child's statistics on his/her own without my supervision.

First, the parent records the child's personal statistics: name, birth date, address, phone number, height, weight, and present age, on Form A-3.

The child then runs through a series of six motor ability tests and his scores are recorded on Form A-3. These scores are then analyzed and compared to a standard score table Form R to determine the child's level of fitness. This level score is then also recorded on the Form A-3 to be compared to future test results. The original score obtained in the six specific tests are compared to the Motor Fitness Norm Scores, Form Q, and then compared to Form R for analyzation and recording.

The six tests involved in this program are: muscular power, agility, upper-body muscular endurance, speed, flexibility, and

muscular strength endurance

Test I

Muscular power is measured through the test of the standing broad jump. It is measured in feet and inches. The child stands with both feet together and with an arm-swinging motion, jumps as far as he can forward, leaving and landing on both feet.

Test II

Agility is performed by the use of the shuttle run test. This test is measured in seconds and tenths. Two blocks are set 30 feet from starting line. On the start sound, the child runs to one end of the floor, picks up one block, turns and runs back, places behind the starting line, turns and goes back to the second block. The timer stops the watch when the child places the second block down behind the starting line.

Test III

Muscular endurance is measured by the number of sit-ups the child can perform in 60 seconds. The sit-up is performed with bent knees and someone holds his/her feet.

Test IV

Flexibility is measured by a simple, sit, reach and hold test. The child sits on a floor mat or rug with legs extended and together. The child then reaches as far or past his toes as possible without forward momentum and without bent knees. The child holds this stretch for five (5) seconds while the parent measures the distance from the sole of the foot to the end of the finger tips (this can be done using a simple measuring tape expressed in inches).

Test V

The speed test is evaluated by having the child complete a 50 yard sprint. The child is timed by a stopwatch and his/her time is measured against the norm score sheet-Form Q and recorded on his/her personal motor fitness score sheet-Form A-3.

Note

As in all the physical fitness tests, the subject is given an individualized training program which is personally instructed by myself on how to perform his/her training schedule properly.