Fitness and Wellness 12th edition Hoeger Solutions Manual

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CHAPTER 2
ASSESSMENT OF PHYSICAL FITNESS

The assessment of physical fitness helps to determine your present fitness levels, serves as a starting point and provides an incentive to exercise, and allows you to evaluate progress and monitor changes throughout the years.

OBJECTIVES

- Identify the health-related components of physical fitness.
- Be able to assess cardiorespiratory fitness.
- Understand the difference between muscular strength and muscular endurance.
- Learn to assess muscular strength.
- Be able to assess muscular flexibility.
- Understand the components of body composition.
- Be able to assess body composition.
- Learn to determine recommended body weight.
- Learn to assess disease risk based on body mass index (BMI), waist circumference, and waist-to-height ratio.

EXPANDED CHAPTER OUTLINE

I. THE VALUE OF FITNESS TESTING
   A. This chapter covers the assessment of the health-related components of physical fitness:
      1. Cardiorespiratory endurance.
      2. Muscular strength and endurance.
      3. Muscular flexibility.
      4. Body composition.
   B. Fitness testing in a comprehensive program is important to:
      1. Educate yourself regarding the various fitness components.
      2. Assess your fitness level for each health-related fitness component and compare the results to health fitness and physical fitness standards.
      3. Identify areas of weakness for training emphasis.
      4. Motivate you to participate in exercise.
      5. Use as a starting point for your personalized exercise prescription.
      6. Evaluate the progress and effectiveness of your program.
      7. Make adjustments in your exercise prescription, if necessary.
      8. Reward yourself for complying with your exercise program.
   C. Pre- and post-exercise tests (at least 8 weeks apart) are recommended.
   D. A personal fitness profile is provided in Activity 2.1 to record the test results.
   E. Use the results to write personal fitness goals in Chapter 3, Activity 3.4.
   F. To begin, determine testing safety by completing the Physical Activity Readiness Questionnaire (PAR-Q) (Activity 1.2).

II. RESPONDERS VERSUS NONRESPONDERS
   A. The **principle of individuality**
      1. Defined: Heredity plays a major role in individual response to exercise and should be considered when designing exercise programs.
      2. **Responders**
         a. Individuals who exhibit improvements in fitness as a result of training.
         b. Increases between 15–20% in VO_{2max} are typical after several months of training.
      3. **Nonresponders**
         a. Individuals who exhibit small or no improvements in fitness compared to others who undergo the same training program.

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b. Constitute less than 5% of exercise participants.
c. May be related to low levels of leg strength.
d. Lower body strength training has been shown to help these individuals.

III. FITNESS ASSESSMENT BATTERY

A. Because health-related fitness has four components, a battery of tests is necessary to determine an individual's overall level of fitness.
B. Health Fitness Standard (Figure 2.1)
1. Linked to epidemiological data of better health and disease risk.
2. Requires only moderate amounts of physical activity.
3. Fitness improvements are not as notable.
4. Significant health benefits result:
a. Reduction in blood lipids.
b. Lower blood pressure.
c. Weight loss.
d. Stress release.
e. Lower risk for diabetes and cardiovascular disease..
f. Lower risk for premature mortality.
5. Improvement in the **metabolic profile** and **metabolic fitness**:
a. Better insulin sensitivity.
b. Better glucose tolerance.
c. Improved cholesterol levels.
6. Attainment of **health fitness standards**:
a. Moderate amount of exercise.
b. Equivalent to walking 2 miles in less than 30 minutes, five to six times per week.
C. **Physical Fitness Standard**
1. Set higher than the health fitness standard.
2. Requires a more vigorous exercise program.
3. May enable the capacity to perform daily work and recreational activities without undue fatigue:
a. Changing a tire.
b. Chopping wood.
c. Climbing several flights of stairs.
d. Playing a game of basketball.
e. Mountain biking.
f. Playing soccer with the grandchildren.
g. Walking several miles around a lake.
h. Hiking through a national park.
D. Objective of the fitness program:
1. Use the health fitness standard if the objective is to lower the risk of disease.
2. Use the physical fitness standard if the objective is to participate in a moderate to vigorous fitness program to achieve a much higher level of fitness.

IV. CARDIORESPIRATORY ENDURANCE

A. This is the most important component of health-related physical fitness for all individuals, with the exception among older adults for whom muscular fitness is important for maintaining **functional independence**.
B. The ability of the lungs, heart, and blood vessels to deliver adequate amounts of oxygen to the cells to meet the demands of prolonged physical activity.
C. Oxygen is used by the cells to convert food substrates (carbohydrates and fats) into energy.
D. Activities that promote cardiorespiratory respiratory endurance , or aerobic fitness, include:
1. Brisk walking.
2. Jogging.
3. Elliptical training.
4. Cycling.

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5. Spinning.
6. Rowing.
7. Swimming.
8. Cross-country skiing.
9. Aerobics.
10. Soccer.
11. Basketball.
12. Racquetball.

E. Benefits of a cardiorespiratory program include:
1. Higher cardiac muscle strength.
2. Higher oxygen carrying capacity (**maximal oxygen uptake**, or **VO_{2max}**).
   a. The maximum amount of oxygen utilized per minute.
   b. Absolute (whole body) measurement units: liters per minute (L/min).
   c. Relative (per average amount of body) measurement units: milliliters per kilogram body weight per minute (mL/kg/min).
3. Lower resting heart rate.
4. Lower blood pressure.
5. Lower blood lipids (cholesterol and triglycerides).
6. Lower recovery time following exercise.
7. Lower risk for hypokinetic diseases (those associated with sedentary living).

Critical Thinking: While your absolute maximal oxygen uptake remains unchanged, your relative maximal oxygen uptake can increase without engaging in an aerobic exercise program. How can you accomplish this, and would you benefit from doing so?

F. Oxygen Uptake
1. Expressed in liters per minute.
2. A measure of cardiorespiratory capacity and ability to produce energy.
3. The body burns about 5 calories for every liter of consumed oxygen.
4. Resting oxygen consumption ranges from 0.3 to 0.5 liters per minute.
5. Exercise oxygen consumption can exceed 5 liters per minute for highly conditioned athletes.
6. The average person exercises between 50% and 75% of their maximal oxygen uptake, thus expending 7 to 12 calories/min during vigorous-intensity aerobic exercise.
7. Energy consumption calculations during exercise using oxygen data.
   a. Given: VO_{2max} of 3.5 L/min
   b. Given: exercising at 60% intensity for 30 minutes
   c. Given: 1 pound of fat = 3,500 calories
   d. VO_2 consumption = 3.5 L/min × 0.6 = 2.1 L/min
   e. Caloric consumption = 2.1 L/min × 5 calories/L = 10.5 calories/min
   f. Workout energy consumption: 10.5 calories/min × 30 min = 315 calories
   g. Number of workouts to burn 1 pound of fat = 3,500 calories ÷ 315 calories/session = 11 sessions

G. Assessing Cardiorespiratory Endurance
1. Maximal Tests
   a. Any test that requires all-out effort, such as the 1.5-Mile Run Test or a treadmill stress test.
   b. The American College of Sports Medicine (ACSM) recommends that a physician be present for all maximal exercise tests for apparently healthy men over age 45 and women over age 55.
2. Submaximal Tests
   a. Not requiring all-out effort, such as a walking test.
   b. A physician should be present when testing individuals at higher-risk (disease symptoms and disease history).

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3. 1.5-Mile Run Test
    a. Used most often to determine cardiorespiratory endurance.
    b. Data collected is the time to cover the 1.5 miles.
    c. Equipment needed is a stopwatch and measured course.
    d. This is a maximal test, requiring all-out effort.
    e. Unconditioned or higher-risk individuals should not participate.
        (1) Unconditioned beginners should have 6 weeks of aerobic training before participating.
        (2) Those with known cardiovascular disease or risk factors for heart disease or men over 45 years old and women over 55 years old should not participate.
    f. Mild stretching, walking, and slow jogging precede the test.
    g. Unusual symptoms during the run/walk terminate the test.
    h. A 3–5 minute walking or jogging cool-down follows the test.
    i. Table 2.1 estimates the individual's VO_{2max} based on test time.
    j. Table 2.2 determines the individual's fitness category based on VO_{2max}.
    k. Example: A 20-year-old female runs in 12 minutes and 40 seconds. Table 2-1 shows a predicted maximum oxygen uptake (VO_{2max}) of 39.8 mL/kg/min. Table 2.2 places her in the "good" cardiorespiratory fitness category.
4. 1.0-Mile Walk Test
    a. Equipment needed is a stopwatch and measured course equal to 1.0 mile (e.g., 440 track would equal four laps).
    b. Walk 1.0 mile <u>at a brisk pace</u>, eliciting at least a 120 beats/minute heart rate.
    c. Count a 10-second (carotid or radial; see photos) pulse immediately upon completing the 1.0 mile.
    d. Multiply the pulse count by 6 to express the count in beats per minute.
    e. Convert the seconds of the walk time into minutes. Do this by dividing the seconds of the walk time by 60.
    f. Plug the variables into the VO_{2max} prediction formula: $VO_{2max} = 88.768 - (0.0957 \times W) + (8.892 \times G) - (1.4537 \times T) - (0.1194 \times HR)$
    g. W = weight in pound; G = gender (0 for women; 1 for men); T = total walk time in minutes; HR = immediate post exercise heart rate in minutes.
    h. Table 2.2 determines the individual's fitness category based on VO_{2max}.

V. MUSCULAR FITNESS

A. Good strength enhances quality of life in the following ways:
    1. It increases lean (muscle) mass.
    2. It stresses the bones, thus preserving density and decreasing osteoporosis risk.
    3. It provides support and stability to the skeletal structure (bones and joints).
    4. It helps increase and maintain **resting metabolism**.
    5. It encourages weight loss and maintenance.
    6. It improves balance and restores mobility.
    7. It makes lifting and reaching easier.
    8. It decreases the risk for injuries and falls.
    9. It reduces chronic low back pain and alleviates arthritic pain.
    10. It lowers cholesterol, high blood pressure, and the risk for developing diabetes.
    11. It promotes psychological well-being.
    12. It will also, with time, decrease heart rate and blood pressure response to heavy lifting, which will improve the ability to perform daily function more efficiently and with less injury or fatigue.

B. Muscular Strength and Muscular Endurance
    1. **Muscular Strength**
        a. The ability to exert maximum force against resistance.
        b. Tests focus on muscular strength or a combination of muscular strength and endurance.
        c. One cannot develop muscular strength without developing muscular endurance.

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2. **Muscular Endurance**
    a. The ability to exert submaximal force repeatedly over a period of time.
    b. Related more to strength than to cardiorespiratory endurance.
    c. One cannot develop muscular endurance without developing muscular strength.

C. Muscular strength and endurance are necessary for everybody. It is valuable in:
1. Performing daily activities:
    a. Sitting.
    b. Walking.
    c. Running.
    d. Lifting and carrying.
    e. Housework.
    f. Recreational activities.
2. Establishing appearance and self-image.
3. Developing sports skills.
4. Promoting stability of joints (very important in the aged population).
5. Meeting life emergencies.

D. Muscular strength and endurance are critically important for older adults.
1. They may be the most important health-related components to maintain.
2. Older individuals have been found to benefit greatly by strength training.
3. Helps to prevent **sarcopenia**, loss of muscle mass.
4. Research has shown leg strength improvements as high as 200% in previously inactive adults over age 90.

E. Determining Strength
1. **One repetition maximum** (**1 RM**)
    a. The maximal amount of resistance a person is able to lift in a single effort.
    b. Requires a considerable amount of time.
2. Muscular Endurance Test
    a. Measurement of how many repetitions can be performed against a submaximal exercise.
    b. Uses three exercises: Bench Jump, Modified Dip (men), Modified Push-Up (women), and Bent-Leg Curl-Up.
    c. Equipment needed includes: stopwatch, metronome, bench or gymnasium bleacher (16.25 inches high), and a partner.
    d. Bench Jump: Number of times the individual can jump or step entirely up onto and down from the bench (bleacher) step in one minute (see photo).
    e. Modified Dip: Done by men only. Number of times the elbows can be flexed 90 degrees with hands behind on a bench (bleacher) and a partner (or chair) holding the feet up in front. The motion is done to a 56 beat-per-minute two-step (up–down) cadence (see photo).
    f. Modified Push-Up: Done by women only. Number of repetitions with hands at shoulder width and fingertips facing forward. The body is supported by the knees, the chest must touch to the floor for each repetition, and the cadence is 56 beats per minute (two-step up–down; see photo).
    g. Bent-Leg Curl-Up: Number of upright repetitions (up to 100) at a 40 beat-per-minute (up–down) cadence, with knees at approximately100 degrees, feet on the floor, and arms crossed with hands on shoulders (see photo).
    h. Abdominal Crunch is recommended when curl-up is contraindicated because of susceptibility to low back injury, but is difficult to eliminate form breaks (see procedure and photo). You can also use a Crunch-Ster Curl-Up Tester available from Novel Products.
    i. Table 2.3 assigns a fitness category based on repetitions.
    j. Table 2.4 assigns points based on fitness category achieved.
    k. Table 2.5 determines overall muscular strength and endurance when the point contributions from all tests are added together.
        a. These results can be recorded in Activity 2.1 Pre-Test.

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VI. MUSCULAR FLEXIBILITY

A. The achievable range of motion at a joint or group of joints without causing injury.
B. Most people who exercise don't take time to stretch.
C. **Flexibility** is highly specific and varies by joint and individual.
D. Good flexibility:
    1. Promotes healthy muscles and joints.
    2. Reduces the risk for injury.
    3. Enables movements of turning, lifting, and bending.
E. Poor flexibility:
    1. Can cause poor posture.
    2. Is the cause of 80% of low back pain in the U.S.
    3. This backache syndrome costs billions of dollars in workplace productivity and worker medical compensation each year.
F. Benefits of a regular flexibility program:
    1. It helps to maintain good joint mobility.
    2. It increases resistance to muscle injury and soreness.
    3. It prevents low back pain and other spinal column problems.
    4. It improves and maintains good postural alignment.
    5. It enhances proper and graceful body movement.
    6. It improves personal appearance and self-image.
    7. It facilitates the development of motor skills throughout life.
G. Muscular flexibility relates primarily to genetic factors and the index of physical activity.
    1. Beyond that, factors such as joint structure, ligaments, tendons, muscles, skin, tissue injury, adipose (fat) tissue, body temperature, age, and gender influence the range of motion about a joint.
    2. On average, women are more flexible than men and seem to retain this advantage throughout life.
H. Other benefits of flexibility exercises:
    1. Successful treatment of **dysmenorrhea** (painful menstruation).
    2. Reduces neuromuscular tension (stress) and knots (trigger points) in muscles and fascia.
    3. Effective contribution to vigorous exercise warm-up preparation and cool-down routines.
    4. Maintenance of mobility in older adults, which enables the participation in (and benefits of) subsequent activity.
I. Assessing Flexibility
    1. Modified Sit-and-Reach Test
        a. Equipment needed is the Acuflex I sit-and-reach tester or a yardstick on top of a box.
        b. Begin with feet against the box (shoes off), with hips, back, and head against a wall (see photos).
        c. The reference reach is determined by touching the reach indicator to the fingertips of superimposed extended hands (head and back remains against the wall).
        d. Without bending the knees, the head and back then come off of the wall as the subject bends forward, pushing the box slide with the fingertips and holding the final position 2 seconds.
        e. The average of two trials is recorded with the subject holding the final position on the third stretch forward for each trial.
        f. The fitness categories based on the number of inches reached are given in Table 2.6 and the number of points achieved for this test are found in Table 2.4.

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2. Finger Touch Test
    a. Used to assess shoulder flexibility.
    b. After warming up, do a few shoulder stretches before beginning.
    c. Bring your right hand over your right shoulder as far as possible, with fingers extended and pointing straight to the ground.
    d. Simultaneously, place your left hand behind your lower back, with palm facing out, slide the hand up as far as possible with fingers extended.
    e. Objective is to bring the tips of the fingers as close together or overlapping if possible, holding the final reach position for 2 seconds.
    f. Measure the nearest half-inch distance between the tips of the fingers, recorded as a negative score, or the amount of overlap between the fingers, recorded as a positive score. If the fingers meet with no overlap, the score is recorded as zero. Conduct the test twice using the average of the two trials as the final score.
    g. Repeat the test on the left side (bring the left hand over the left shoulder and the right hand behind the lower back). Do two trials and average the final score.
    h. Refer to Table 2.7 and Table 2.4 to determine the respective fitness categories and number of points for each side test.
3. Overall Flexibility Fitness
    a. To obtain an overall flexibility fitness category, use the number of points given for the Modified Sit and Reach Test and the best result only (either right or left side) for the Finger Touch Test.
    b. Table 2.8 shows the muscular flexibility fitness categories by total points.
    c. Flexibility test results can be recorded onto Activity 2.1, Personal Fitness Profile: Pre-Test.

VII. BODY COMPOSITION

A. Obesity is a health hazard of epidemic proportions in the United States and most developed countries throughout the world.
B. The average American adult gains 1–2 pounds of weight each year.
    1. About 0.5 pounds of lean tissue is lost.
C. By age 65, this gain is about 40 pounds (Figure 2.2).
    1. About 20 pounds of lean tissue is lost.
    2. About 60 – 100 pounds of fat is gained.
D. **Body composition** is the fat and nonfat components of the human body (Figure 2.3).
    1. **Percent body fat** is an expression of the fat in the body.
        a. The fat needed for normal physiological functions is called **essential fat**:
            i. Three percent of body weight in men.
            ii. Twelve percent of body weight in women.
            iii. Higher in women because of gender-specific fats such as that found in the breast, tissue, the uterus, and other gender-related fat deposits .
        b. The body fat stored in adipose tissue is called **storage fat**:
            i. Subcutaneous fat just below the skin.
            ii. Visceral fat around major organs (Figure 2.6)
    2. **Lean body mass** is an expression of the nonfat tissue in the body.
E. Obesity accounts for 15–20% of the annual mortality in the U.S.
    1. One of the six major risk factors for coronary heart disease.
    2. Obesity is also a risk factor for:
        a. Hypertension.
        b. Congestive heart failure.
        c. Elevated blood lipids.
        d. Atherosclerosis.
        e. Stroke.
        f. Thromboembolitic disease.
        g. Varicose veins.
        h. Intermittent claudication.

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3. Sixty-nine percent of the adult population in the United States is either overweight or obese (Figure 2.4).

F. Underweight individuals also have a higher mortality rate.
   1. There is a gradual increase in incidence of eating disorders such as anorexia nervosa and bulimia nervosa.
   2. Medical conditions include:
      a. Heart damage.
      b. Gastrointestinal problems.
      c. Shrinkage of internal organs.
      d. Immune system abnormalities.
      e. Disorders of the reproductive system.
      f. Loss of muscle tissue.
      g. Damage to the nervous system.
      h. Death.

G. People have hitherto relied on height/weight charts to determine **recommended body weight**, but we now know that these tables are highly inaccurate.
   1. The proper way to determine recommended weight is to find out what percent of total body weight is fat and what amount is lean tissue (body composition).

H. Assessing Body Composition
   1. Dual Energy X-Ray Absorptiometry (DXA)
      a. Used in research and by medical facilities.
      b. Radiographic technique that uses very low-dose beams of X-ray energy to measure total body fat mass.
      c. Also measures fat distribution patterns and bone density.
      d. Many exercise scientists consider DXA to be the standard technique to assess body composition.
   2. Hydrostatic (Underwater) Weighing and Air Displacement
      a. Most frequently used in exercise physiology and fitness laboratories.
      b. A person's regular weight is compared to his or her weight taken underwater where fat is more buoyant.
   3. Air Displacement
      a. Uses computerized pressure sensors to determine the amount of air displaced by a person sitting inside an airtight chamber.
      b. Body volume is calculated by subtracting the air volume with the person from the volume of the empty chamber.
      c. Additional research is needed to determine accuracy.
   4. Bioelectrical Impedance
      a. Simple to use.
      b. Sends a painless current through the body.
      c. Is based on fat resisting the current more than lean tissue because it consists of less water. The easier the conductance, the leaner the individual.
      d. Accuracy is questionable.
   5. Skinfold Thickness
      a. Most frequent method used to estimate body composition.
      b. Assumes that approximately half of body fat is subcutaneous.
      c. Assessment sites for women (Figure 2.5):
         i. Triceps.
         ii. Suprailium.
         iii. Thigh.
      d. Assessment sites for men (Figure 2.5):
         i. Abdomen.
         ii. Chest.
         iii. Thigh.
      e. All measurements are taken on the right side of the body with the person standing.

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f. Each site is measured by grasping a double thickness of skin firmly with the thumb and forefinger, pulling the fold slightly away from the muscle tissue.
g. Hold the calipers perpendicular to the fold, and take the measurements half an inch below the finger hold.
h. Measure each site three times, and read the values to the nearest .1 to .5 mm.
i. Record the average of the two closest readings as the final value.
j. Table 2.9 (women) and Table 2.10 (men) estimate percent fat from the sum of the three sites (in mm).
k. Table 2.11 indicates recommended percent body fatness by age and gender. The low end of the recommended range constitutes the physical fitness standard, and the higher end of the recommended range constitutes the health fitness standard.

6. **Body Mass Index** (**BMI**)
   a. Uses height and weight.
   b. BMI = 705 × body weight (lb) ÷ square of body height (in)..
   c. Activity 2.2 and Table 2.12 aid these computations.
   d. Table 2.13 shows that:
      i. Below 18.5 is underweight, with increased risk for disease.
      ii. 22–25 indicates lowest risk for disease.
      iii. 25–30 is classified as overweight (mortality rates >25%).
      iv. Above 30 is considered obese (mortality rates >50–100%).
   e. BMI is a good screening tool for the general population, but it does not differentiate between fat weight and lean body mass. So strength athletes or individuals with a high degree of muscularity will have a high BMI when in fact they have low body fat.
7. Waist Circumference
   a. The location of major fat deposition may be an indicator of disease risk.
      i. **Android** "apple" deposition around the trunk and abdomen appears to show greater risk.
      ii. **Gynoid** "pear" deposition around the thighs and hip appears to show lesser risk.
   b. Waist measurement is a simple, less costly alternative to high-tech scanning techniques (Tables 2.14 and 2.15).
      i. Measurements above 40 inches (men) and 35 inches (women) indicate the highest risk for cardiovascular disease, hypertension, and type 2 diabetes. This fat is deposited as visceral fat (around internal organs) and not as much subcutaneous fat (beneath the skin) (Figure 2.6).
8. Waist-to-Height Ratio: "Keep Your Waist Circumference to Less Than Half Your Height."
   a. The **waist-to-height ratio** (**WHtR**) is a new health risk assessment also used to ascertain the health risks of obesity.
   b. The ratio is rapidly gaining popularity in the scientific community as research indicates that it is better predictor of health outcomes, including multiple coronary heart disease risk factors, than **BMI** or **waist circumference (WC)**.
   c. **WHtR** is determined by dividing the waist circumference in inches by the height in inches.
   d. As illustrated in Table 2.15, a ratio of .4 to .5 indicates the lowest risk for disease, whereas less than .4 or between .5 and .7 require "care" to decrease health risks, and a ratio of .7 or greater requires "action" to conform with the lowest health risk category of .4 to .5.

Critical Thinking: How do you feel about your current body weight? What influence does society have on the way you perceive yourself in terms of your weight? Do the results from your body composition measurements make you feel any different about the way you see your current body weight and image?

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I. Effects of Exercise and Diet on Body Composition
   1. If you engage in a diet and exercise program, you should repeat body composition measurements about once a month to monitor changes in lean and fat tissue.
      a. Important because lean body mass is affected by weight reduction programs as well as physical activity.
      b. Changes in body composition resulting from a weight control/exercise program are illustrated in Figure 2.7.

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CHAPTER 2
ASSESSMENT OF PHYSICAL FITNESS
STUDENT ACTIVITIES

DISCUSSION ON THE INTERNET

As the Internet is very popular with students, provide them with an opportunity to become involved outside of classroom time.

1. Post discussion for students to answer.
2. Establish a Chat Room with specific topics to be discussed by students.
3. Create a time for students to "Ask the Professor" in a live Chat Room format.

SMALL GROUP DISCUSSIONS (IN CLASS)

Organize students into small groups (5–6 students).

1. Ask students questions specific to the topic(s) being discussed in class.
2. Allow students about 5 minutes to discuss the topic(s).
3. Have each group report on its discussion of the topic(s).
4. Also have each group post its discussion on the course website, so other students can read at their leisure.

PROGRESS REPORTS

Give simple prospective and retrospective quizzes to keep students reading and thinking.

1. Put multiple-choice, true–false, or short answer questions on a half-sheet of paper.
2. This requires students to make a commitment to some controversial choices.
3. Use the questions as an outline for topics of the day.

CARDIORESPIRATORY ENDURANCE LAB (Tables 2.1 and 2.2)

1. Decide whether to administer the 1.5-Mile Run Test or 1.0-Mile Walk Test.
2. Mark off the 1.5- or 1.0-mile course. The track allows for constant supervision, even though there is possible lapping and confusion of number of laps completed.
3. For the 1.0-Mile Walk Test, have a clock clearly readable at the finish line to enable an immediate post-exercise heart rate count.
4. Describe and encourage the warm-up procedures.
5. Begin all students at the same time (group them if the course will not contain the whole class) and call out lap times and lap number feedback as they pass throughout the test.
6. Clearly call out finish times and remind them to measure an immediate 10-second heart rate if doing the 1.0-Mile Walk Test.
7. Encourage a cool-down after recording their finish data.
8. Have them submit the evaluated individual results at the next class meeting.

MUSCULAR STRENGTH AND ENDURANCE LAB (Tables 2.3–2.5; Activity 2.1)

1. Prepare the bleachers, benches, or chairs for the Muscular Endurance Test.
2. Encourage and describe the warm-up procedures.
3. Have students work in pairs to assist each other with the test battery.
4. Make a route of timed stations for the groups if helpful in expediting test administration.
5. Have them then record, rate, and report their data individually using Tables 2.3–2.5 and Activity 2.1.

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FLEXIBILITY LAB (Tables 2.6–2.8)

1. Have the Acuflex I sit-and-reach tester and Acuflex II total body rotation tester ready for assessment.
2. Describe and encourage the warm-up procedures.
3. Explain the test protocols after dividing students into two- or three-person groups.
4. Each group member serves as technician and subject in rotation, generating data on all students.
5. Have them work on individual calculations and final flexibility assessment using Activity 2.1 and Tables 2.6–2.8.

SKINFOLD LAB (Figure 2.5 and Tables 2.9–2.11)

1. Assign students to same-gender partner groups.
2. Demonstrate the skinfold sites and technique as one partner practices on the other. Allow time to switch roles while also instructing the second partners.
3. Have them now measure the three sites and estimate body fatness for each other.
4. "Spot check" the technicians' results by making measurements yourself (another spot-checker of the other gender is sometimes helpful).
5. Direct them to Tables 2.9–2.11, Figure 2.5, and Activity 2.1 for body fatness estimation, classification, and recording.

RECOMMENDED BODY WEIGHT CALCULATION (Activity 2.2; Table 2.12)

1. Each student must have the results of the skinfold lab (or another procedure estimating percent body fat).
2. Explain that the most effective way to recommend body weight is to estimate lean body mass and "add back" the desired amount of body fat. This sets the stage for the recommended body weight equation.
3. Use Activity 2.2 to show the recommended body weight calculations.
4. Then discuss what amount of body fat percentage is "desired." Use Table 2.12 (health fitness standard and physical fitness standard) as well as mini case study examples of underweight, ideal, and overweight individuals to set these "desired" body fat goals.
5. Students should then perform the calculations of Activity 2.2 and report results.

GIRTH LAB (Tables 2.12–2.15; Activities 2.1 and 2.2)

1. Describe how waist circumference can indicate risk for disease.
2. Discuss the subpopulations at risk based on central adiposity.
3. Have students perform waist measurements and interpretation of the results (Table 2.14).
4. Have students calculate body mass index (BMI) for themselves (Table 2.12).
5. Describe what BMI can and cannot do in assessing body composition and how it can work with waist circumference in assessment (Table 2.15).
6. Finally, have students interpret and record the results using Activities 2.1 and 2.2.

GUEST SPEAKERS OR FIELD TRIPS

1. Invite experts to describe/demonstrate techniques of health-related fitness assessment.
2. Alternatively, take the class to a fitness or medical facility to talk with fitness professionals and observe techniques in action.

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QUESTIONNAIRES

Have students fill out:

1. Activity 2.1, Personal Fitness Profile: Pre-Test and Post-Test.
2. Activity 2.2, Computation Form for Recommended Body Weight, Body Mass Index (BMI), and Waist Circumference (WC).

INTERPRETING THE REAL LIFE STORY

Jamie's Fitness Test Results

I didn't exercise a whole lot when I was in high school. I took a few years off from school to work and subsequently to get married. I always watched my weight and although not the athletic type, I felt that I was in shape. When I came back to school, I took a fitness class and the instructor required that we do all the health-related fitness tests. I couldn't run a mile and a half, but it really surprised me that even for the 1-mile walk test I was only in the fair category. My strength and **flexibility** were fair and good, and although my BMI was in the acceptable category, my body fat was too high. The results of my fitness tests were an eye-opening experience and made sense based on my limited exercise time the last few years. I was determined to do something and started to exercise according to what I learned in class. At the end of the term, I was proud of myself: My body fat was now better than the health fitness standard, and I was also able to do the mile-and-a-half test running the entire time and scoring in the good category. I am proud of my progress, and now in my second year, I still exercise regularly at the Student Rec Center.

Critical Thinking Questions

1. Before Jamie went back to school, she was fairly sedentary, yet she was not overweight. Is there a difference between being thin and being fit?
2. According to Jamie's fitness assessment results at the start of her class, in which of the health-related components of physical fitness (cardiorespiratory endurance, muscular strength and endurance, muscular flexibility, and body composition) was she doing well and in which was she doing poorly?
3. Getting subpar results on her fitness assessments made Jamie determined to take charge of her fitness and begin an exercise program. What factors motivate you to want to become more fit?

WEB RESOURCES

1. The President's Challenge – Physical Fitness Test: https://www.presidentschallenge.org/challenge/physical/

2. How Fit Are You? See How You Measure Up: http://www.mayoclinic.com/health/fitness/SM00086

3. Development and Validation of Criterion-Referenced Clinically Relevant Fitness Standards for Maintaining Physical Independence in Later Years: http://hhd.fullerton.edu/csa/Research/documents/Developmentandvalidationofcriterionreferencedfitnessstandards2012.pdf

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Creating a Profile

When you log into Diet & Wellness Plus for the first time, you must create a profile, as illustrated in Figure 24, below. Note that this is the "Long Activity Questionnaire," which asks you for fairly extensive information so that Diet & Wellness Plus can build an accurate profile for you. If you create any Secondary Profiles (more about this on the next page) then you have a choice whether to re-take the Long Activity Questionnaire, or take a shorter questionnaire, in which case the data from your long questionnaire for your Primary Profile will be used for your Secondary Profile as well.

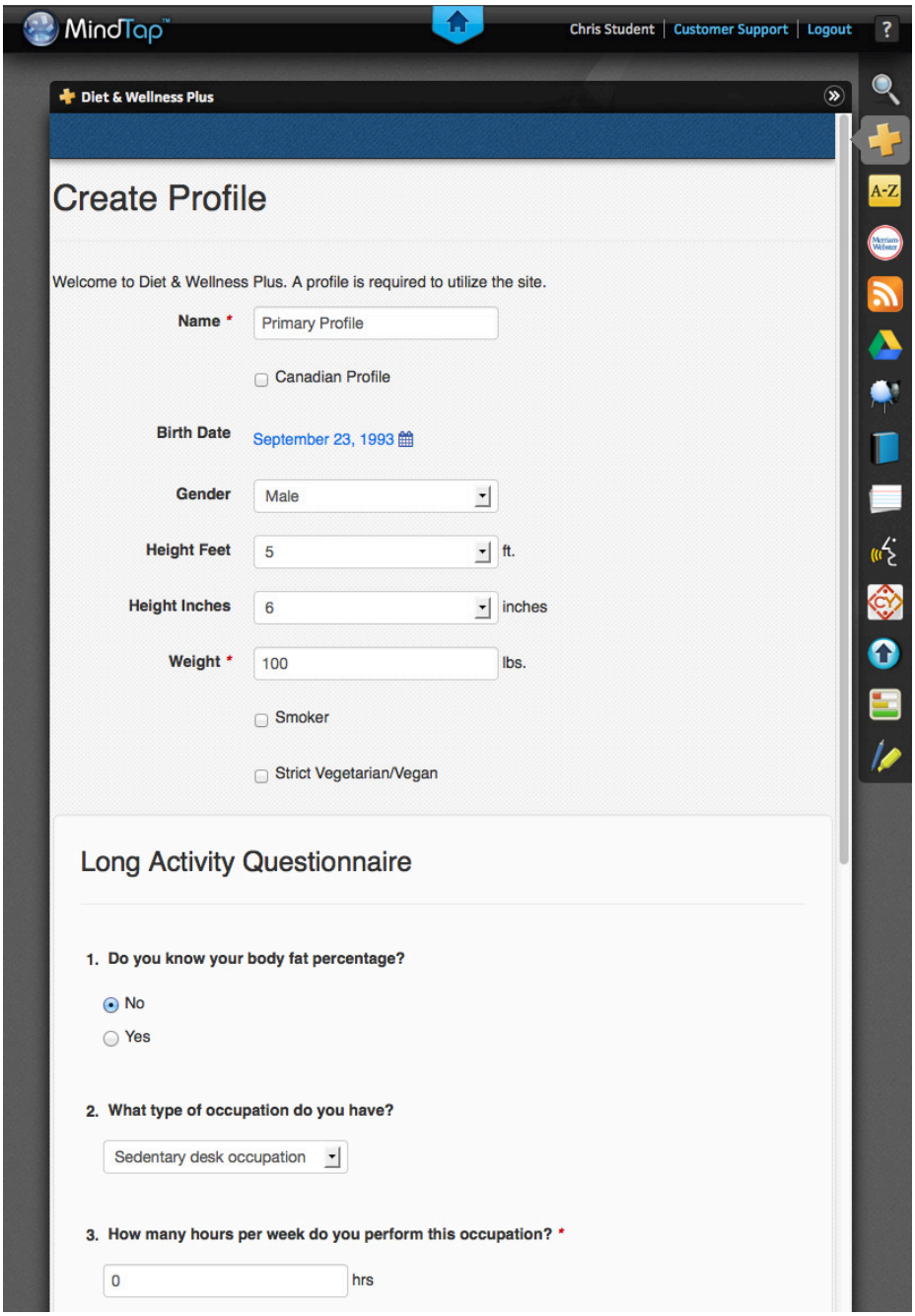

Figure 24 – Any user logging into Diet & Wellness Plus for the first time must create a new profile.

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After filling in all fields and answering all requisite questions, click on the Submit button, as shown in Figure 25, below. After you've completed your profile (hereafter known as your Primary Profile), you can create Secondary Profiles by clicking on the "Primary Profile" menu that will appear on your Dashboard (which is covered in the next section of this manual). It is important to note that the Track Change functions of Diet & Wellness Plus can only be used with your Primary Profile and not any Secondary Profiles. We'll cover this in greater detail in the Track Change section of this manual.

There are numerous reasons you might want to create one or more Secondary Profiles, such as experimenting to see how changes to your diet and activities could affect your health.

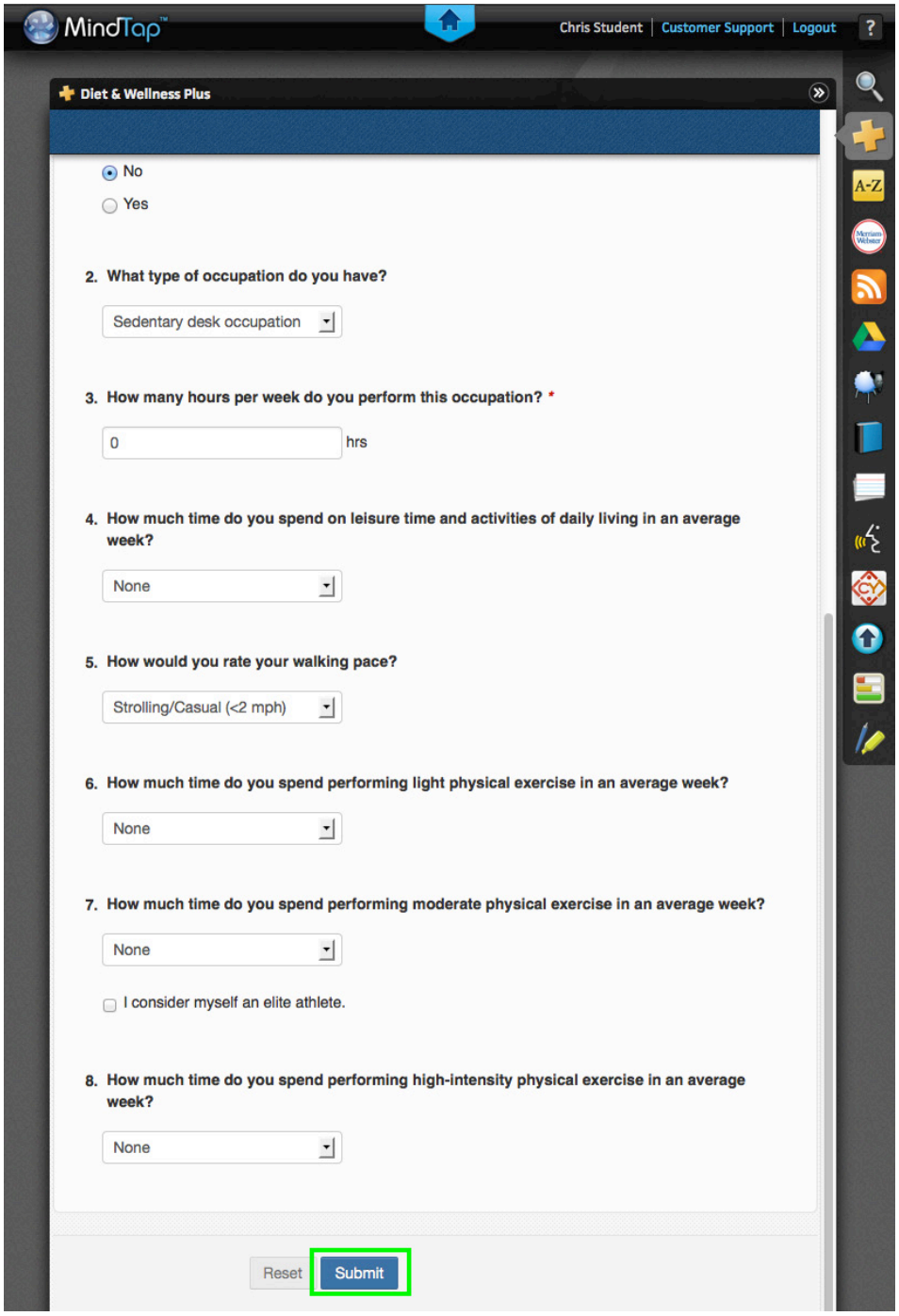

Figure 25 – After filling in all fields and answering all questions, click the Submit button.

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Creating a New Course

After clicking on the Create Course button (as shown on the previous page, in Figure 5), you'll see the options shown in Figure 6. Select "Create New Course" and click "Continue."

On the next screen, you'll fill in details such as:

1. Course Name*
2. Course Start Date*
3. Course End Date*
4. Course Days/Times
5. Section
6. Time Zone*

*Required Fields

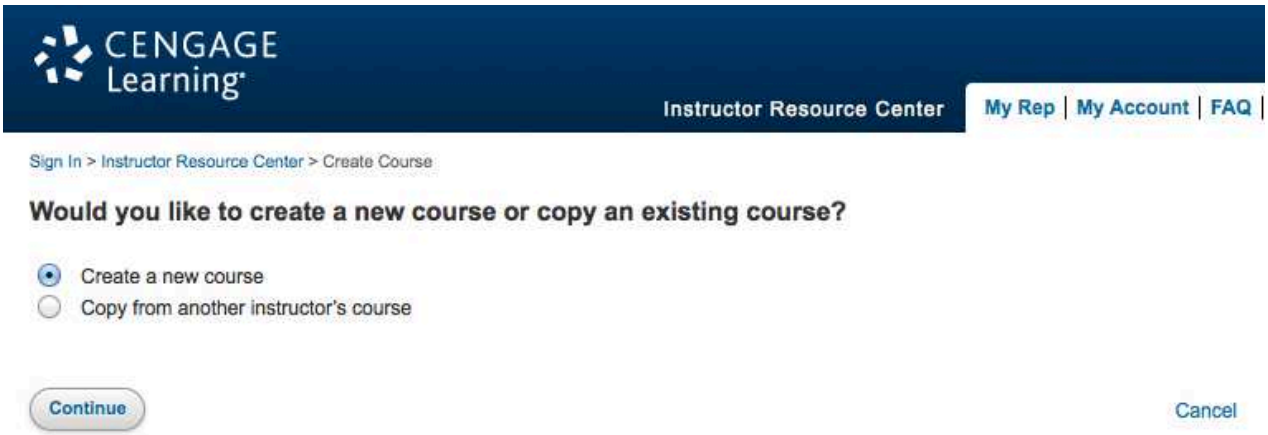

Figure 6 – Select "Create New Course" and click "Continue."

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On the Create Course screen, fill in all requisite fields and be sure to select your correct Time Zone in the pull-down menu and then click Create Course.

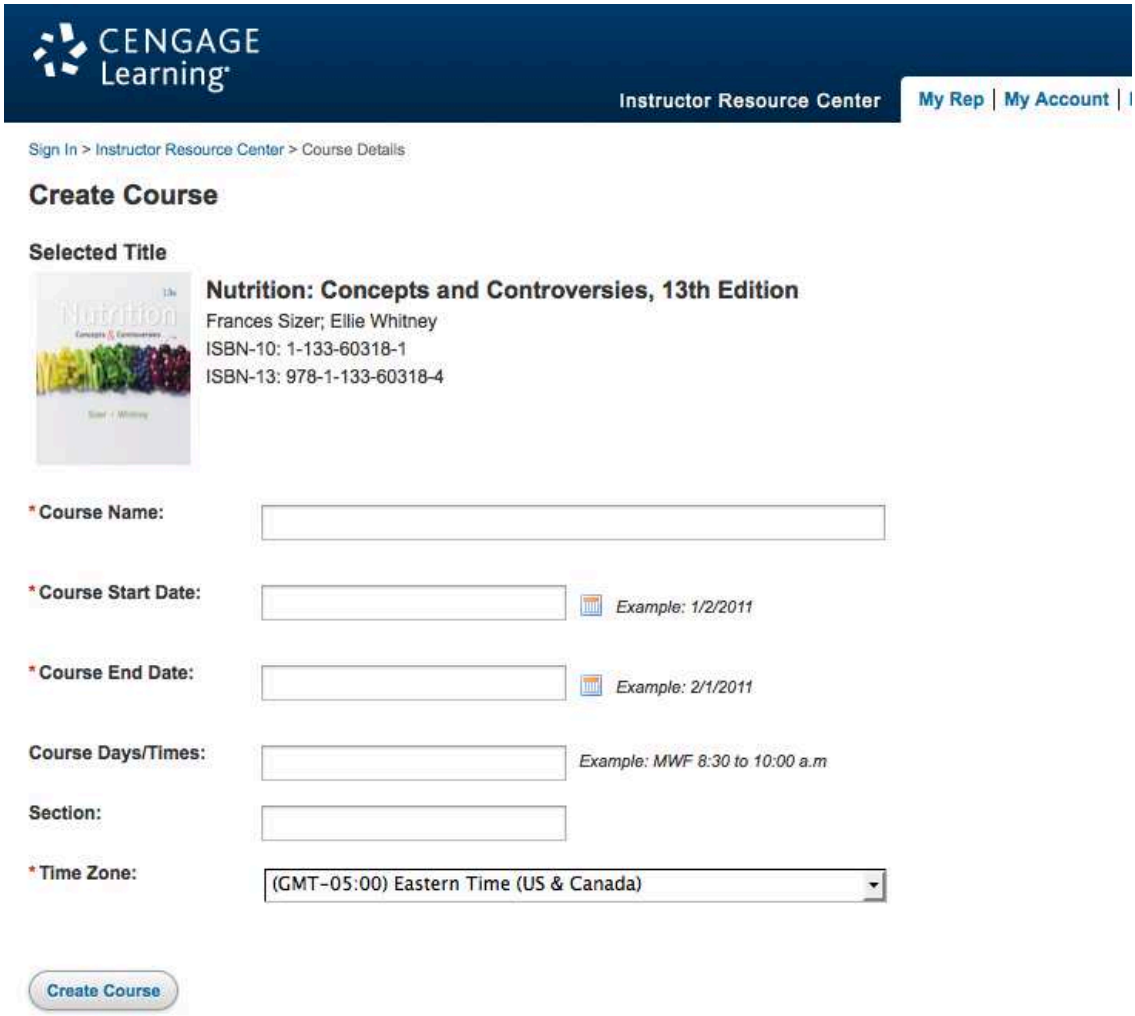

Figure 7a – Fill in all requisite fields, select your Time Zone, and then click Create Course.

You will now arrive at the Manage Courses screen. Be sure to provide the Course Key (which is automatically generated) to your students, because they'll need it to enroll in your course.

Figure 7b – Provide the Course Key (which is automatically generated) to your students.

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After you've created your course, you'll see it appear under the My Course header. In the example in Figure 8, the created course is named, "My Diet & Wellness Plus Course." Click on this course name to proceed.

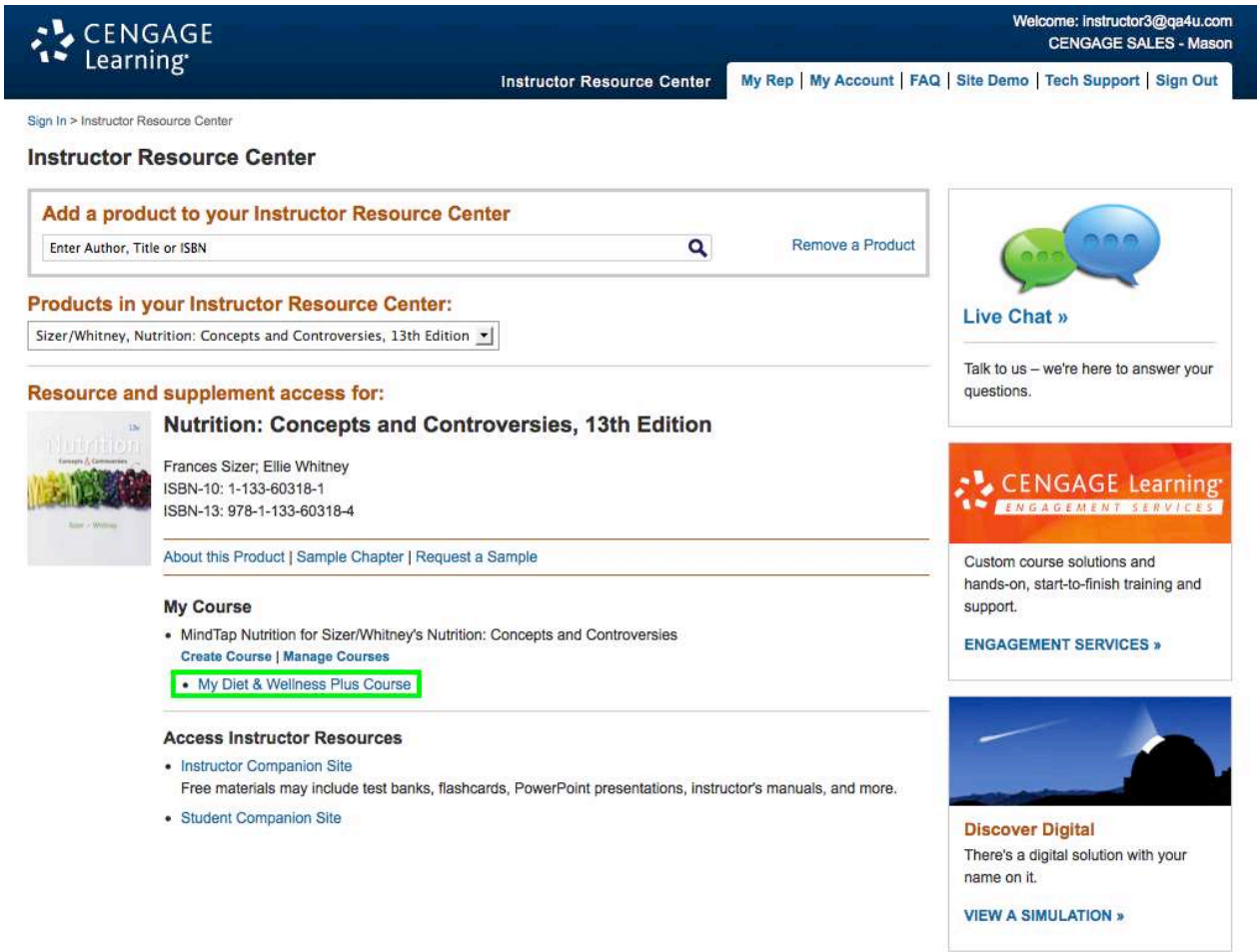
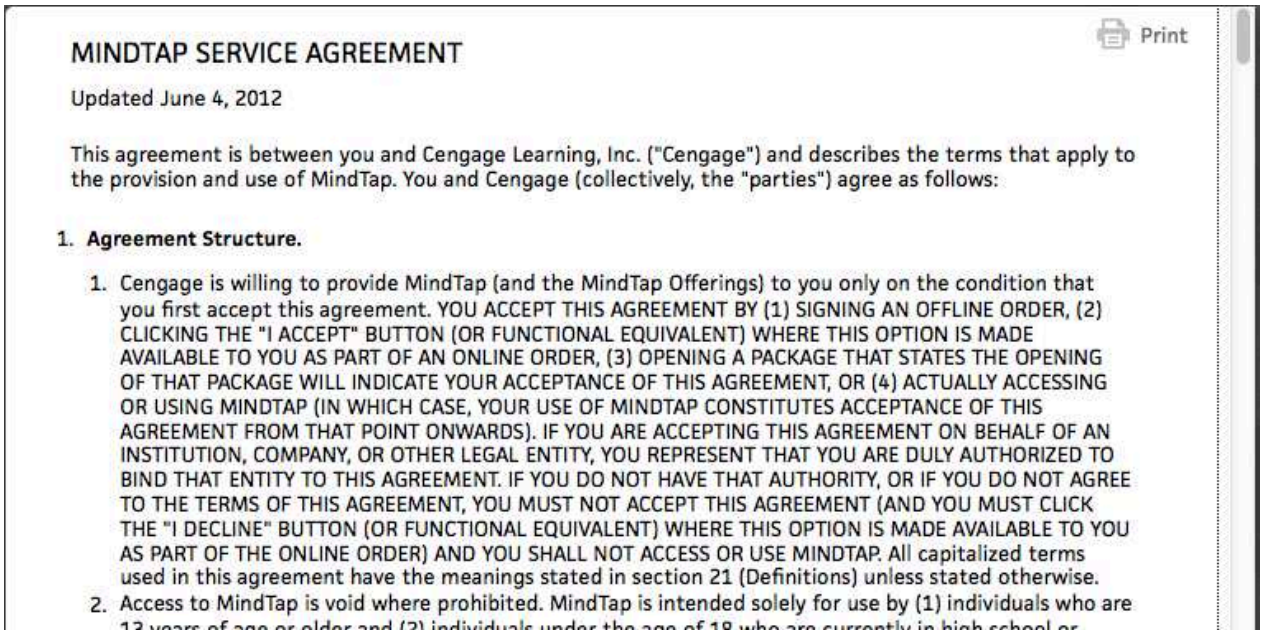


Figure 8 – Click on your course name (under the My Course header).

Next, you'll see the MindTap Service Agreement. Review it and then scroll to the bottom of it.



Print

MINDTAP SERVICE AGREEMENT

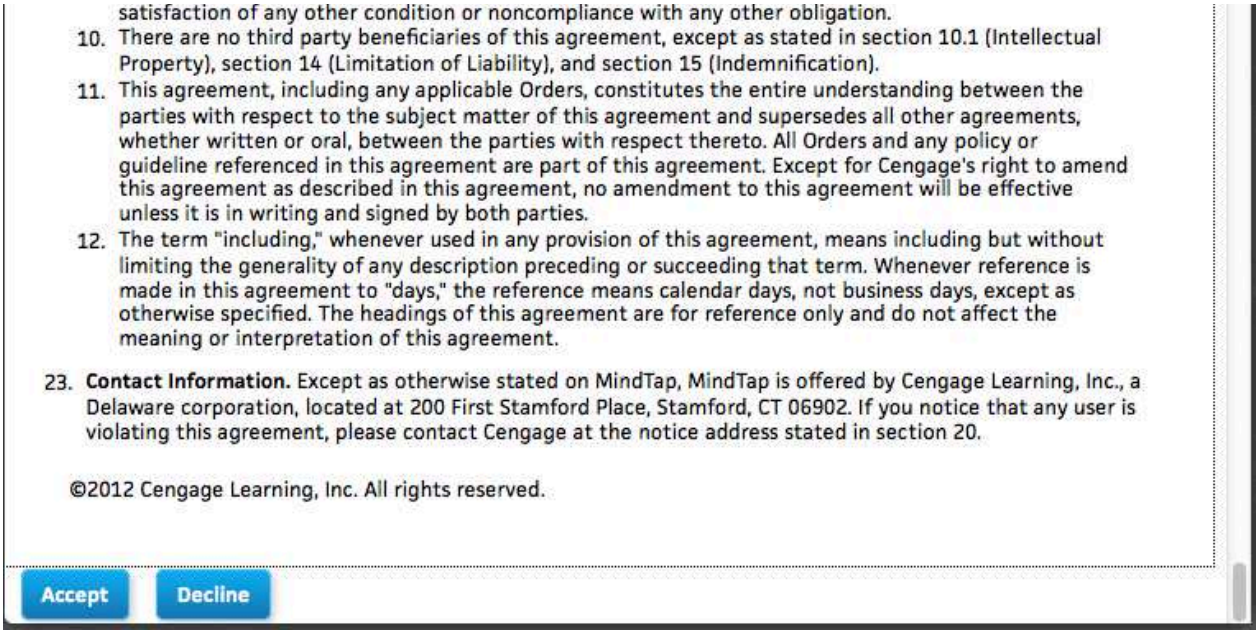
Updated June 4, 2012

This agreement is between you and Cengage Learning, Inc. ("Cengage") and describes the terms that apply to the provision and use of MindTap. You and Cengage (collectively, the "parties") agree as follows:

1. **Agreement Structure.**
   1. Cengage is willing to provide MindTap (and the MindTap Offerings) to you only on the condition that you first accept this agreement. YOU ACCEPT THIS AGREEMENT BY (1) SIGNING AN OFFLINE ORDER, (2) CLICKING THE "I ACCEPT" BUTTON (OR FUNCTIONAL EQUIVALENT) WHERE THIS OPTION IS MADE AVAILABLE TO YOU AS PART OF AN ONLINE ORDER, (3) OPENING A PACKAGE THAT STATES THE OPENING OF THAT PACKAGE WILL INDICATE YOUR ACCEPTANCE OF THIS AGREEMENT, OR (4) ACTUALLY ACCESSING OR USING MINDTAP (IN WHICH CASE, YOUR USE OF MINDTAP CONSTITUTES ACCEPTANCE OF THIS AGREEMENT FROM THAT POINT ONWARDS). IF YOU ARE ACCEPTING THIS AGREEMENT ON BEHALF OF AN INSTITUTION, COMPANY, OR OTHER LEGAL ENTITY, YOU REPRESENT THAT YOU ARE DULY AUTHORIZED TO BIND THAT ENTITY TO THIS AGREEMENT. IF YOU DO NOT HAVE THAT AUTHORITY, OR IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, YOU MUST NOT ACCEPT THIS AGREEMENT (AND YOU MUST CLICK THE "I DECLINE" BUTTON (OR FUNCTIONAL EQUIVALENT) WHERE THIS OPTION IS MADE AVAILABLE TO YOU AS PART OF THE ONLINE ORDER) AND YOU SHALL NOT ACCESS OR USE MINDTAP. All capitalized terms used in this agreement have the meanings stated in section 21 (Definitions) unless stated otherwise.
   2. Access to MindTap is void where prohibited. MindTap is intended solely for use by (1) individuals who are

Figure 9 – Review the MindTap Service Agreement and scroll to the bottom of it.

At the bottom of the MindTap Service Agreement, you may opt to Accept or Decline the agreement. You'll need to Accept it if you wish to continue.



satisfaction of any other condition or noncompliance with any other obligation.

10. There are no third party beneficiaries of this agreement, except as stated in section 10.1 (Intellectual Property), section 14 (Limitation of Liability), and section 15 (Indemnification).
11. This agreement, including any applicable Orders, constitutes the entire understanding between the parties with respect to the subject matter of this agreement and supersedes all other agreements, whether written or oral, between the parties with respect thereto. All Orders and any policy or guideline referenced in this agreement are part of this agreement. Except for Cengage's right to amend this agreement as described in this agreement, no amendment to this agreement will be effective unless it is in writing and signed by both parties.
12. The term "including," whenever used in any provision of this agreement, means including but without limiting the generality of any description preceding or succeeding that term. Whenever reference is made in this agreement to "days," the reference means calendar days, not business days, except as otherwise specified. The headings of this agreement are for reference only and do not affect the meaning or interpretation of this agreement.

23. **Contact Information.** Except as otherwise stated on MindTap, MindTap is offered by Cengage Learning, Inc., a Delaware corporation, located at 200 First Stamford Place, Stamford, CT 06902. If you notice that any user is violating this agreement, please contact Cengage at the notice address stated in section 20.

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Accept Decline

Figure 10 – Review the MindTap Service Agreement and Accept it if you wish to continue.

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After you've accepted the MindTap Service Agreement, you'll see the book cover page, as illustrated in Figure 11, below. Click the Enter button to proceed to MindTap.

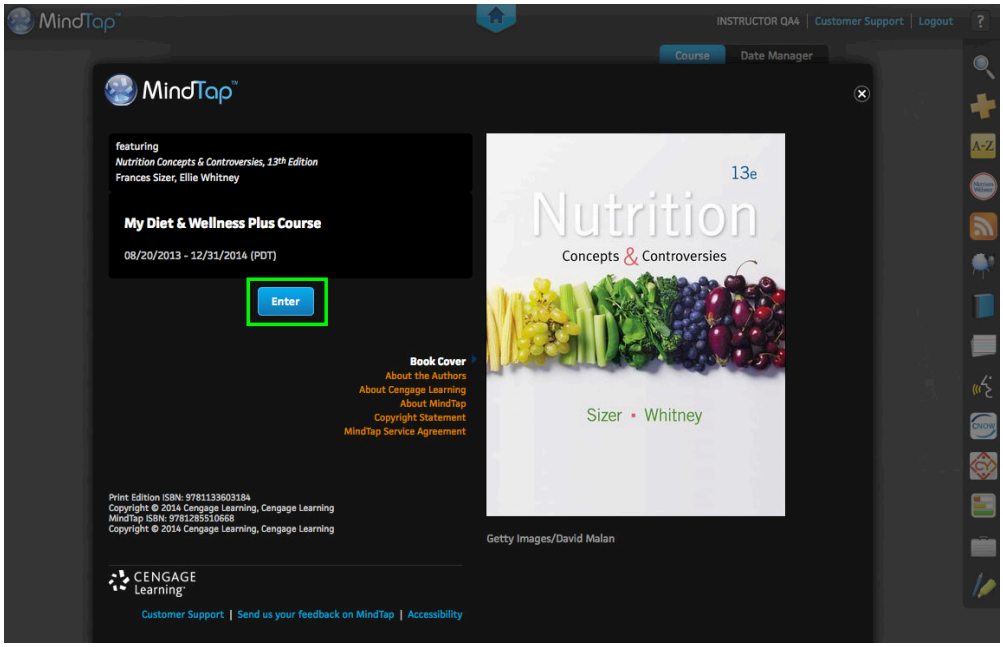

Figure 11 – Click Enter to proceed to MindTap.

The first time you access MindTap, you'll see the Help screen, as seen in Figure 12, below. You can view this Help screen again any time by clicking Help. To close this screen, click on the "X" button in the upper-right corner of the of the screen.

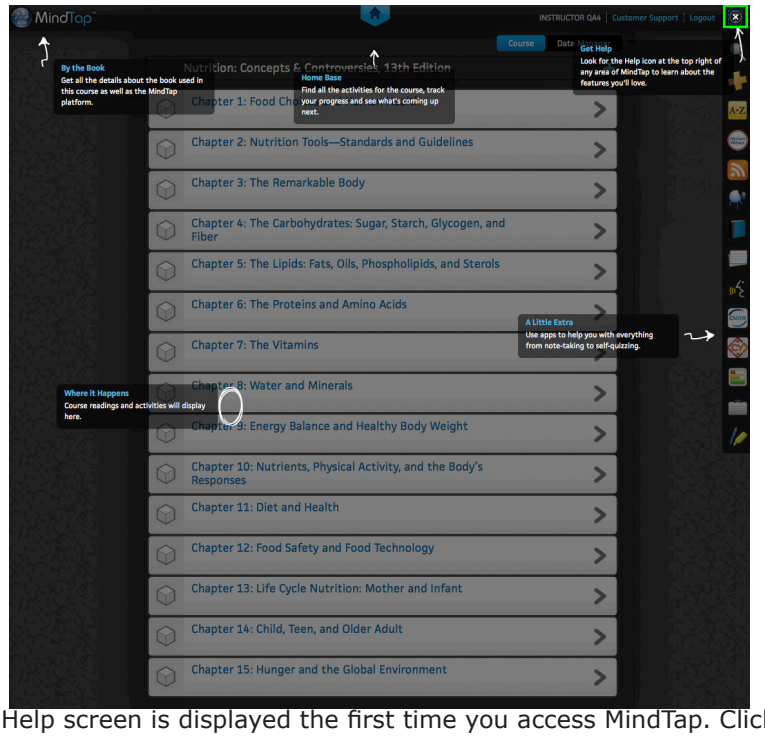

Figure 12 – The Help screen is displayed the first time you access MindTap. Click the "X" button to continue.

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You have now arrived at the MindTap home screen. To proceed to Diet & Wellness Plus, click on the "Diet & Wellness Plus" icon (the golden plus "+" symbol) in the application bar along the right side of the screen.

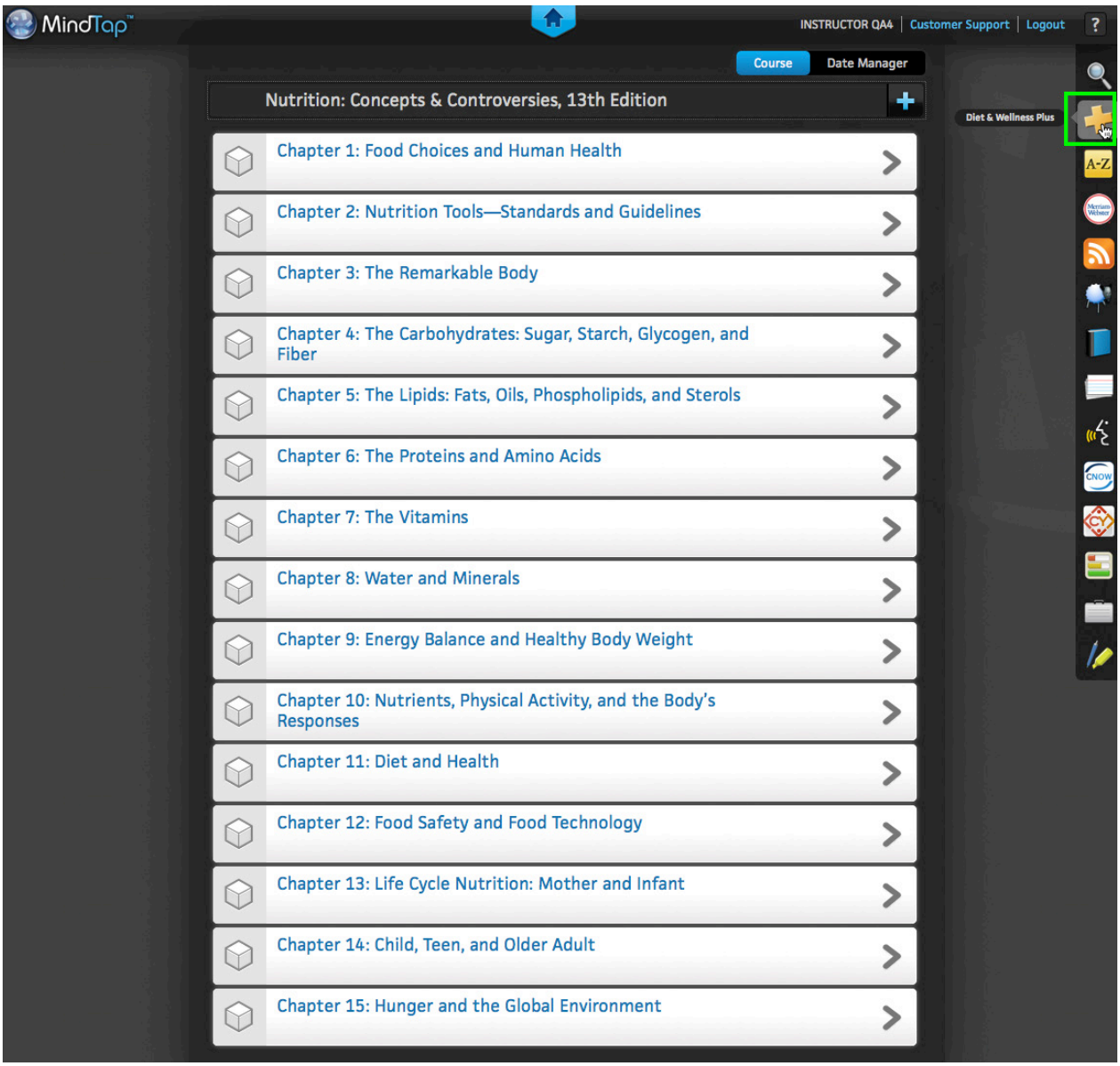

Figure 13 – Click the Diet & Wellness Plus icon in the application bar to continue.

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