

**College of Micronesia-FSM
PO Box 159
Pohnpei, FM 96941**

COURSE OUTLINE

Resistance Training
Course Title

ESS101r Exercise Sport Science
Department & Number

Course Description:

This is a semester-long course designed to improve muscular strength, endurance and flexibility through various forms of resistance training, and to give students an appreciation of the role regular physical activity plays in the quality of life. Types of resistance utilized in this course may include resistance tubing, gravity, dumbbells, barbells, medicine balls, and other equipment designed specifically for the purpose of improving muscular strength and endurance. Students will learn basic skeletal muscle anatomy, resistance exercises for major muscle groups, and flexibility exercises for major muscle groups. Course topics also include evaluation of current fitness levels, and injury prevention specific to resistance training.

Course Prepared by: Rachel Hollingsworth

State Pohnpei/National Campus

	Hours per week		No. of week	Total Hours	=	Semester Credits
Lecture	_____	x	_____	x	=	_____
Laboratory	<u> 3 </u>	x	<u> 16 </u>	= <u> 48 </u>	=	<u> 1 </u>
Workshop	_____	x	_____	x	=	_____

Purpose of Course:

Degree Requirement	_____
Degree Elective	<u> x </u>
Certificate	_____
Other	<u> x </u>

Prerequisite Courses: None.

Signature, Chairperson, Curriculum Committee

Date Approved by Committee

Signature, President, COM-FSM

Date Approved by President

I. Course Objectives

A. General/Program Outcomes

1. Students will participate regularly in physical activity.
2. Students will learn skills necessary to perform a variety of physical activities.
3. Students will determine baseline measures of personal fitness.
4. Students will be able to identify common injuries, treatment, and preventative measures.
5. Students will value physical activity and its contribution to a healthful lifestyle.

B. Student Learning Outcomes

Upon successful completion of this course, the student will be able to:

1. [Core] Correctly perform one resistance training exercise for each of the major muscle groups of the body: gastrocnemius, hamstrings, quadriceps, hip adductors, hip abductors, gluteus maximus, abdominals, erector spinae, latissimus dorsi, rhomboids/trapezius, pectoralis major, deltoids, biceps brachii, triceps brachii.
2. [Core] Identify the location of the major muscle groups on their own bodies.
3. [Core] Perform a full-body resistance training workout in 30 – 40 minutes.
4. [Core] Perform flexibility exercises for each of the major muscle groups.
5. [Core] Have measured their resting heart rate.
6. [Core] Have measured their blood pressure.
7. [Core] Have measured their upper body and lower body strength ratios (via estimated one-repetition maximum and body weight).
8. [Core] Have measured their abdominal muscular endurance (via timed curl-up test).
9. [Core] Have measured their erector spinae/hamstrings flexibility (via a sit and reach test).
10. [Core] have measured their body fat.
11. [Core] Orally recite the words from the acronym RICE: rest ice compress elevate.
12. [Core] Identify the symptoms of overtraining, preventative measures, and basic treatment in a written format.
13. [Core] Identify diseases and illnesses inversely related to physical activity level.
14. [Core] Express how regular physical activity makes them feel (in a written, oral, or visual format).
15. [Peripheral] Perform a resistance training exercise for the anterior tibialis, rotator cuff, wrist flexors, and wrist extensor muscle groups.
16. [Peripheral] Perform additional resistance training exercises for each of the major muscle groups of the body.
17. [Peripheral] have measured their foot size (men's/women's).
18. [Peripheral] Identify the symptoms of common resistance training injuries, preventative measures, and basic treatment in an oral question and answer format
19. [Optional] Conduct and perform a 10-repetition maximum strength test for the pectoralis major/deltoids/triceps and the hamstrings/quadriceps/gluteus maximus.
20. [Optional] Conduct and perform a timed curl-up test to measure the muscular endurance of the abdominals.
21. [Optional] Conduct and perform a sit and reach test.
22. [Optional] Identify the location of the major muscle groups on an anatomical chart.

II. Course Content

- A. Introduction to Exercise Science/Fitness
 - i. Five Factors of Physical Fitness
 - 1. Cardiovascular
 - 2. Muscular Strength
 - 3. Muscular Endurance
 - 4. Flexibility
 - 5. Body Composition
 - ii. Pretests
 - 1. Heart rate/blood pressure
 - 2. 10 repetition maximum
 - a. (To estimate one repetition maximum: 10 RM/0.75)
 - b. Strength ratio: Est. 1 RM/body weight)
 - 3. Curl-up & Push-up tests
 - 4. Sit and reach test
 - a. (Sit and reach, curl-up and push-up instructions and norms
<http://darkwing.uoregon.edu/~eatr/student/ft/fmf.html>)
 - 5. Percent body fat
 - a. (Body composition norms
<http://darkwing.uoregon.edu/~eatr/student/ft/ftbc.html>)
 - iii. Delayed Onset Muscular Soreness
- B. Exercise Logs/Exercises for the Pectoralis, Deltoids & Triceps
 - i. Anatomy of chest/shoulder/arms
 - ii. Sets, Repetitions (Reps), Load, Rest intervals
 - iii. Push ups, Bench press, chest press
 - iv. Military press, side raise, front raise
 - v. Close-grip push-ups, bench dips, triceps extensions
- C. Exercises for the Latissimus Dorsi, Rhomboids, Trapezius, Biceps and forearms/review
 - i. Anatomy of back/shoulder/arms
 - ii. Pull-ups, pull-downs, rowing (bent-over rows)
 - iii. Shoulder shrugs, reverse flyes, rowing (upright rows)
 - iv. Biceps curls (neutral, supinated & neutral palm positions)
 - v. Review previous concepts
- D. Instability/Exercises for the quadriceps, hamstrings, gluteus maximum, gluteus minimus, gluteus medius and gastrocnemius/Review
 - i. Base of support and muscle force production
 - ii. Anatomy of legs/buttocks
 - iii. Lunges
 - iv. Squats
 - v. Deadlifts
 - vi. Leg extensions, leg curls
 - vii. Review previous concepts
- E. Exercises for the quadriceps, hamstrings, gluteus maximum, gluteus minimus, gluteus medius and gastrocnemius/Review
 - i. Review lunges, squats and deadlifts
 - ii. Calf raises
 - iii. Side-lying leg lifts, superior and inferior legs on each side
 - iv. Hip extension
 - v. Review previous concepts
- F. Isometric/Exercises for the Core (Gluteus, abdominals, erector spinae)
 - i. Introduction to types of contractions
 - ii. Isometric contractions
 - iii. Anatomy of abdominals/low back/buttocks
 - iv. Review gluteus exercises
 - v. Bridges (prone), hundreds, supine crunches, side crunches
- G. Exercises for the rotator cuff, wrist flexors/extensors & anterior tibialis
 - i. Injury prevention for joints

- ii. Anatomy of rotator cuff/wrist/ankle
- iii. External rotation, internal rotation
- iv. Hammer curls, wrist flexion/extension
- v. Dorsiflexion
- vi. Review previous concepts
- H. Full body workout/overtraining
 - i. Exercises for all major muscle groups, 1 exercise per muscle group
 - ii. Symptoms & treatment of overtraining
 - iii. Review previous concepts
- I. Full body workout/benefits of strength training
 - i. Exercises for all major muscle groups, 1 exercise per muscle group
 - ii. Importance of/benefits of muscular strength and muscular endurance for health
 - iii. Review previous concepts
- J. Full body workout/benefits of regular physical activity
 - i. Exercises for all major muscle groups, 1 exercise per muscle group
 - ii. Cardiovascular disease, type II diabetes
 - iii. Review previous concepts
- K. Full body workout/benefits of regular physical activity
 - i. Exercises for all major muscle groups, 1 exercise per muscle group
 - ii. Longevity, morbidity
 - iii. Review previous concepts
- L. Push/pull split
 - i. Split routines – definition & benefits
 - ii. Push one day, two+ exercises per muscle group
 - 1. Gastrocnemius, quadriceps, hip adductors, gluteus maximus, abdominals, pectoralis major, deltoids, triceps brachii, wrist flexors/extensors
 - iii. Pull the next day, two+ exercises per muscle group
 - 1. Anterior tibialis, hamstrings, hip abductors, erector spinae, latissimus dorsi, rhomboids/trapezius, biceps brachii, rotator cuff
 - iv. Review previous concepts
- M. Push/pull split
 - i. Antagonists
 - ii. Push one day, two+ exercises per muscle group
 - iii. Pull the next day, two+ exercises per muscle group
 - iv. Review previous concepts
- N. Three-day split
 - i. Definition, benefits
 - ii. Foot size and anatomy
 - iii. Day one, three+ exercises per muscle group
 - 1. Gastrocnemius, hamstrings, quadriceps, hip adductors, hip abductors, gluteus maximus, anterior tibialis
 - iv. Day two, three+ exercises per muscle group
 - 1. Abdominals, erector spinae, latissimus dorsi, rhomboids/trapezius, biceps brachii.
 - v. Day three, three+ exercises per muscle group
 - 1. Pectoralis major, deltoids, triceps brachii, wrist flexors/extensors, rotator cuff
- O. Training effect, overload
 - i. Definitions, benefits
 - ii. Designing a resistance training workout for improvement
 - iii. Designing a resistance training workout for maintenance
 - iv. Three-day split exercises
- P. Fitness assessments – post-tests
 - i. Heart rate/blood pressure
 - ii. 10 repetition maximum (to estimate one repetition maximum = $10 \text{ RM} / 0.75$; and strength ratio = Est. 1 RM/body weight)

- iii. Curl-up & Push-up tests
- iv. Sit and reach test
- v. Percent body fat
- vi. Review

III. Textbooks

This course requires no textbook.

IV. Required Course Materials

Exercise towel, appropriate attire (loose-fitting, comfortable clothing that allows a full range of motion around all of the joints of the body), and a wire-bound notebook.

V. Reference Materials

American College of Sports Medicine. *ACSM's Guidelines for Exercise Testing and Prescription, 6th Edition*. Philadelphia, PA: Lippincott, Williams and Wilkins 2000.

American College of Sports Medicine. "ACSM Position Stand on The Recommended Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory and Muscular Fitness, and Flexibility in Adults." *Medicine and Science in Sports and Exercise* 30(6): 975–991, 1998.

American College of Sports Medicine. "American College of Sports Medicine Position Stand on Progression Models in Resistance Training for Healthy Adults", *Medicine and Science in Sports and Exercise* 34(2): 364–380, 2002.

Baechle and Earle, eds. *National Strength & Conditioning Association: Essentials of Strength Training and Conditioning-2nd Edition*. Champaign, IL: Human Kinetics 2000.

Carpinelli, Otto & Winett. "A critical analysis of the ACSM position stand on resistance training: Insufficient evidence to support recommended training protocols," *Journal of Exercise Physiology online*, 7(3):1-60, 2004.

Katzmarzyk and Craig. "Musculoskeletal fitness and risk of mortality." *Medicine and Science in Sports and Exercise* 34(5): 740-4, 2002.

Sharkey, Brian J. *Fitness & Health: 5th Edition*. Champaign, IL: Human Kinetics 2001.

(STRONGLY RECOMMENDED)

Any human anatomy textbook

Age With Strength <http://www.pbs.org/stealingtime/living/strength.htm>

American College of Sports Medicine <http://www.acsm.org/index.asp>

National Strength and Conditioning Association <http://www.nscs-lift.org/>

Osteoporosis Prevention <http://www.nof.org/prevention/index.htm>

VI. Instructional Cost

Lifeline USA Chest Expanders \$24.95 each.
Omron Blood Pressure monitor \$89.95.
Stability/PhysioBalls 45cm \$22.95, 55cm \$26.95, 75cm \$34.95, 65cm \$29.95.
Sport pump (to inflate balls) \$22.95.
First Place Medicine Balls 2kg \$24.95, 3kg \$34.95, 5kg \$54.95, 7kg \$69.95.
First Place Core Balls 8lbs. \$39.95, 12lbs. \$49.95.

VII. Methods of Instruction

Demonstration, participation, lecture, individual assignments, group work. Assessment will be in the form of attendance/participation in class exercises, individual assignments, homework and quizzes given throughout the semester.

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	0 – 59%

VIII. Evaluation

No credit by evaluation. Course is participatory.

IX. Attendance Policy

The College attendance policy shall be applied.

X. Academic Honesty Policy

The College academic honesty policy shall be applied.

XI. Appendices

A. Health History Form

- i. All students must complete the Physical Activity Readiness Questionnaire - PAR-Q, from the Canadian Society for Exercise Physiology prior to participating in any physical activity
- ii. Instructor may require students to provide a signed physician consent form as a pre-requisite to ESS101r.
- iii. PAR-Q is available online and may be reproduced if used in its entirety www.csep.ca/pdfs/par-q.pdf

B. Release Form

- i. All students must read and sign the following statement in order to participate in ESS101r:

As per College policy or as follows in the absence of such policy language:

I, _____, wish to participate in the following College of Micronesia-FSM course or program, ESS101r Resistance Training, as a student. I understand that this class is a voluntary program and is not required for my graduation. I agree to abide by all safety rules and regulations in effect during this course or program.

I wish to participate in the above-described course or program at the College of Micronesia -FSM, and agree that the College of Micronesia-FSM, and their employees are not responsible for my participation in this program, or for any injuries that may occur during my participation in this program, or by the utilization of their equipment.

Further, the instructor of this course or program in the event that he or she believes, with or without medical evidence, that I may not participate in this course or program, or that I have physical limitations that may prevent me from participating in this course or program, has absolute discretion, and may terminate my continued participation in the course or program, at any time, with or without a valid reason. However, this discretion is not an obligation of the College of Micronesia-FSM, or its employees, nor a duty, and any failure to prevent participation on my behalf, or to limit the amount of activities involved in the course or program on my behalf, does not give rise to a renunciation of or exception to this knowing and voluntary waiver.

As a result, I agree, and voluntarily assume all responsibility for my own safety and well-being, while participating in the course or program, and agree to waive any claims for liability, injury, or other damages as a result of injury or death, against the College of Micronesia-FSM or their employees. I enter into this waiver knowingly and in advance of my participation in the course or program. By signing this waiver I will forever release any future claims against the College of Micronesia-FSM and their employees, arising out of any accident, injuries, death or other damages, on behalf of myself or my heirs or dependents, due to any accident, or other mishap, including acts of god, that may arise upon my participation in the course or program.

Dated: _____ Print Name

_____ Signature

C. Strength Ratio Charts

i. Reference: *ACSM's Guidelines for Exercise Testing and Prescription, 6th Edition*

ii. UPPER BODY STRENGTH

Percentile	AGES				
	20-29	30-39	40-49	50-59	60+
<i>MEN</i>					
90 – well above average	1.48	1.24	1.10	0.97	0.89
70 – above average	1.22	1.04	0.93	0.84	0.77
50 – average	1.06	0.93	0.84	0.75	0.68
30 – below average	0.93	0.83	0.76	0.68	0.63
<i>WOMEN</i>					
90 – well above average	0.90	0.76	0.71	0.61	0.64
70 – above average	0.74	0.63	0.57	0.52	0.51
50 – average	0.65	0.57	0.52	0.46	0.45
30 – below average	0.56	0.51	0.47	0.42	0.40

iii. LOWER BODY STRENGTH

Percentile	AGES				
	20-29	30-39	40-49	50-59	60+
<i>MEN</i>					
90 – well above average	2.27	2.07	1.92	1.80	1.73
70 – above average	2.05	1.85	1.74	1.64	1.56
50 – average	1.91	1.71	1.62	1.52	1.43
30 – below average	1.74	1.59	1.51	1.39	1.30
<i>WOMEN</i>					
90 – well above average	1.82	1.61	1.48	1.37	1.32
70 – above average	1.58	1.39	1.29	1.17	1.13
50 – average	1.44	1.27	1.18	1.05	0.99
30 – below average	1.27	1.15	1.08	0.95	0.88

- D. Typical class structure
- i. 10 - 15 minutes travel to locker rooms, change into exercise clothes
 - ii. 5 – 10 minute warm up (either general – some cardiorespiratory exercise – or specific – light resistance training specific to the exercises to be performed), with verbal instruction
 - iii. 35 – 45 minutes resistance training/instruction
 - iv. 5 - 10 minutes of flexibility/relaxation exercises
 - v. 10 – 15 minutes change out of exercise clothes/shower
- E. Adapted Instruction
- i. Students who are unable to (or who should not) perform specific exercises due to injury, pregnancy, or other condition(s), will be assigned alternate exercises and/or assignments by the instructor with no detriment to final grade/status in the course
 - ii. Students who require a physician’s consent to participate in physical activity (as identified on a PAR-Q questionnaire) at term start will be required to complete physical fitness examination by a medical doctor and receive physician’s consent prior to commencing the course.
- F. Conditions and definitions
- i. Core refers to an outcome that must be attained in order to pass the course.
 - ii. Peripheral refers to an outcome that ought to be attained but non-attainment will not cause the student to fail the course.
 - iii. Optional refers to an outcome whose coverage is optional. Conditions may or may not allow the outcome to be accomplished.
Performance of resistance training exercises must be safe, in proper anatomical form, free of contraindications, and free of undue momentum
- G. Recommended course materials
- i. Athletic shoes
 - ii. Human anatomy coloring book
 - iii. Bottled water
- H. Safety procedures
- i. CPR certification strongly recommended for instructors of this course
 - ii. Students should be instructed on the first day of class and on their syllabus:
 1. STOP exercising if you experience any of the following symptoms:
 - a. Severe breathlessness
 - b. Nausea/dizziness
 - c. Extreme chest pain
 - d. Light headedness
 2. NOTIFY the instructor immediately. Do NOT isolate yourself by seeking privacy