

# Program Review

Marshall University  
March 2003

Date: November 7, 2003

Program: Master of Science in Exercise Science  
Degree and Title

Date of Last Review: December 21, 1998

## Recommendation

Marshall University is obligated to recommend continuance or discontinuance of a program and to provide a brief rationale for the recommendation.

1. Continuation of the program at the current level of activity;
2. Continuation of the program with corrective action (for example, reducing the range of optional tracks or merging programs);
3. Identification of the program for further development (for example, providing additional college/institutional commitment);
4. Continuation of the program at the current level of activity, with the designation as a program of excellence (See section E); or
5. Discontinuance of the program (Procedures outlined in HEPC Administrative Bulletin 23).

**Rationale for Recommendation:** (Deans, please submit the rationale as a separate document. Beyond the College level, any office that disagrees with the previous recommendation must submit a separate rationale and append it to this document with appropriate signature.)

\_\_\_\_\_  
Signature of person preparing the report:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Signature of Program Chair:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Signature of Academic Dean:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Signature of Chair, Academic Planning Committee/Chair, Graduate Council:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Signature of the Provost and Senior Vice President for Academic Affairs:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Signature of the President:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Signature of Chair, Board of Governors:

\_\_\_\_\_  
Date:

**PROGRAM REVIEW**  
**Master of Science in Exercise Science**  
**Marshall University**  
**November 2003**

The College of Education and Human Services [COEHS] recommends continuation of the Graduate [M.S.] Exercise Science Program [GESP] at the current level of activity. The two previous 5-year Program Reviews received commendations, "...for an excellent assessment." and, "...for providing a well prepared report.", respectively. This Program Review is being submitted for consideration of the designation, **PROGRAM OF EXCELLENCE**. The COEHS enthusiastically supports this request.

The GESP has received strong support in questionnaire feedback from both graduates and their employers. Graduates are achieving professional success, moving into positions of responsibility and assuming leadership roles, with careers in the clinical, community, corporate, and commercial settings. The faculty has performed exceedingly well and are recognized on national and international levels for their expertise. GESP clinical programs provided for the community are improving the lives of Tri-State residents as well as impacting other clients/patients and programs across the country as they are replicated by graduates. In the words of one employer, "These students raise the bar...."

The GESP assessment process is ongoing because of the strength of graduate, employer, and internship site networks. The program website is a valuable vehicle in this process: [www.marshall.edu/coehs/hpl](http://www.marshall.edu/coehs/hpl) The accompanying report provides strong documentation with both hard data and anecdotal responses for the rigor and effectiveness of the GESP. Grads as well as employers gave high marks to the curriculum. They particularly appreciate the emphasis on problem solving [i.e., "... thinking with a pencil, a piece of paper, and your brain."] with assigned clinical tasks using carefully structured strategies. As well, the application of critical thinking to intellectually challenging medical profiles and case study management were also very favorably received. Responses by internship supervisors have been equally favorable. Accordingly, program enrollment has grown 100% and 26% over the last two 5-year reporting periods and 152% in the 15 years since its inception. Because of its popularity, the program is logistically at capacity for managing the number of students enrolled with the current faculty size, equipment, and facilities.

There is demonstrable evidence of faculty achievement and scholarly activity. They have collectively published 33 articles and made 71 professional presentations over the past 5 years. They have authored or co-authored and assisted in the preparation of position papers, clinical practice guidelines, books, book chapters, and important messages in the popular press in the areas of cardiac rehabilitation and cardiovascular medicine, diabetes management, strength and conditioning, performance enhancement, athletic training, and sports medicine.

The GESP provides a rigorous and effective curriculum with productive and nationally recognized faculty. Graduates provide the Tri-State region and other areas across the country with well-trained professionals in the clinical, community, corporate, and commercial settings. Clinical programs improve the lives of Tri-State residents. For these and other more highly detailed reasons in the Program Review, the COEHS strongly supports the **Designation of Excellence** for the **M.S. in Exercise Science**.

Signature of the Dean:

College of Education and Human Services Dean Tony L. Williams \_\_\_\_\_ Date:

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**I. PROGRAM DESCRIPTION:**

|                        |               |                     |
|------------------------|---------------|---------------------|
| Exercise Science       | MS Degree     | Marshall University |
| <b>Name of Program</b> | <b>Degree</b> | <b>Institution</b>  |

**Date of last Review:** December 21, 1998

**PROGRAM NARRATIVE**

The Division of Exercise Science, Sport, and Recreation offers the Master of Science in Exercise Science to prepare students for careers in the clinical, community, corporate and commercial settings. Preparation for such careers includes an emphasis on leadership roles and skills that permit one to work with individuals on a continuum extending from the elite athlete to those with chronic disorder/disease that includes the cardiac transplantation patient as well as the recreational athlete and those simply wishing to stay healthy by living sensibly.

The course of study is a two-year program with a 39 credit hour requirement. Full admission requires a 3.00 GPA, an appropriate academic background, personal interview, three letters of reference, GRE, and Graduate College admission. The Clinical Applied Area of Emphasis requires completion of a clinical internship. A thesis or internship option is provided for the Exercise Physiology Area of Emphasis.

Research clearly shows that seventy percent (70%) of all premature death and chronic disability could be prevented with appropriate life-style changes. This includes sensible nutrition, exercise, smoking cessation, and related behavioral changes. Such therapeutic lifestyle interventions and risk factor management can significantly reduce all-cause mortality and morbidity from cardiovascular disease, diabetes, osteoporosis, obesity, mental health disorders, and cancer. Our quality of life, as well, can be improved and our chances for longevity increased. Our graduates are becoming major players in an alternative approach to contemporary treatment-oriented health care emphasizing client/patient empowerment with health promotion, disease prevention, and rehabilitation strategies.

The uniqueness of this program resides in the objectives of preparing students for a broad spectrum of careers in health promotion, disease prevention, rehabilitation, wellness, performance enhancement, and research, making them more marketable. This includes assisting them in developing the clinical and scientific attitudes necessary for success in contemporary allied health careers. A clinical attitude includes respect for the client, participant, subject, athlete, or patient under their care. Physician/Scientist Sir William Osler commented, "Ask not what disease the patient has, but, rather, what patient the disease has." This attitude applies to the task of assisting athletes with performance enhancement as well as guiding patients with chronic disease through a program aimed at improving their quality of life and chances for survival.

The scientific attitude is characterized as a respect for clinical and performance assessment procedures and well-taken data whether they are simple measures of heart rate or more sophisticated medical procedures [e.g., coronary angiograms]. Each requires thoughtful attention. A final, all-encompassing, objective is the development of careful, thoughtful, thorough, and responsible work habits in the clinical/professional setting. These attitudes transcend gender, race, and age.

### III. PROGRAM STATEMENT on Adequacy, Viability, Necessity and Consistency with Mission.

#### A. ADEQUACY

##### 1. Curriculum

The Exercise Science program has two (2) program tracks:  
(1) Clinical Applied Area of Emphasis;  
(2) Exercise Physiology Area of Emphasis.

Here are some learning tasks for Exercise Science Masters candidates:

1. Learn and perform policies and procedures for ambulatory Phase I and Phase II cardiac patients and manage the therapeutic lifestyle interventions for these and other selected disorders.
2. Observe imaging at rest and with exercise stress, coronary catheterization, angiography, ventriculography, coronary bypass graft [CABG] surgery, and percutaneous transluminal coronary angioplasty [PTCA] procedures. Understand and interpret angiograms and ventriculograms.
3. Learn and perform cardiac patient risk stratification that includes ventricular function, myocardial ischemia, and dysrhythmia variables, including the Lown Classification System. Consider creatinine, blood glucose, HbA<sub>1C</sub>, and related clinical variables, including blood counts for the formed elements.
4. Understand and apply contraindications to exercise testing and exercise therapy.
5. Receive training in prepping patients for testing [i.e., 12 lead EKG, XYZ Frank leads, if possible] and exercise therapy [i.e., bipolar lead setup, preferably CM5]; assist with multi-stage exercise testing.
6. Develop skills with metabolic assessment of human performance and physical work capacity [PWC] as well as related clinical variables.
7. Develop skills with human performance assessment and performance enhancement.
8. Learn and teach exercise prescription for all modalities. Develop skills for managing patients as they progress through an exercise program. These include preparing patient progress reports and SOAP notes.
9. Learn and evaluate lipid profiles to include total serum cholesterol, triglyceride, and lipoprotein fractions. Include apoproteins and particle density, if possible, as well as electrophoresis phenotypes [even though somewhat outdated].
10. Develop skill in blood pressure assessment as well as teaching patients heart rate assessment skills.
11. Develop background and skills in risk factor awareness and management classes [e.g., lipids, HBP, sedentary lifestyle, smoking cessation, obesity, diabetes, family history, stress, medication awareness, etc.].

12. Assist physicians with physical examinations.
13. Develop EKG reading skills relative to AV blocks, bundle branch blocks, dysrhythmia, preexcitation syndromes [e.g., WPW], contour changes, ventricular hypertrophy, strain, etc. Assess heart rate and pulse routinely and accurately.
14. Understand the clinical procedures for determining the occurrence of a myocardial infarction: symptoms, history, enzymes, EKG changes.
15. Understand elements of a medical profile and relevance to case study analysis and development. The enclosed CASE STUDY FORMAT: MEDICAL PROFILE TEST outline may be used for this purpose.
16. Develop budgeting, business, and logistical skills; personnel management and evaluation.
17. Develop an awareness of Advanced Cardiac Life Support [ACLS] perspectives and procedures. Pursue ACLS certification.
18. Develop an appreciation for “Doctors’ Orders” and standing orders relative to ACLS and clinical procedures, including exercise prescription, etc.
19. Develop a *clinical attitude* that includes respect for the patient:
 

*“Ask not what disease the patient has, but, rather, what patient the disease has.” Sir William Osler [physician and scientist]*
20. Develop a *scientific attitude*, respect for clinical assessment and data, respect for well-taken heart rate and blood pressure measures as well as the most sophisticated medical procedures.

□

*A final, all-encompassing, task is the development of careful, thoughtful, thorough, and responsible attitudes and work habits that permit consideration of clinical tasks with carefully structured strategies.*

**a. Clinical Applied Area [CAA] of Emphasis:**

Graduates are employed in health promotion, disease prevention, rehabilitation, wellness and related research positions. In addition to their conventional employment in the clinical setting, students in the CAA have gone on to complete doctorates – including the Pharm. D., enter medical school and become physicians, study to become Physician Assistants, complete requirements for Registered Dietician [R.D.] certification, join the pharmaceutical and pacemaker industries, qualify as electrophysiology specialists in cardiology, and complete the MBA to become government health care administrators. The clinical orientation in these settings requires student practitioners to complete a six credit hour internship in a clinical setting [480 hours] and take a comprehensive oral examination at the completion of their studies.

b. **Exercise Physiology Area [EPA] of Emphasis:**

Graduates have long-term goals of continuing their education to the doctorate level and entering research-oriented careers. In recent years, we have seen a trend with some of these graduates entering clinical and administrative wellness positions as well. EPA students have also gone on to receive MBA's and enter the pharmaceutical and pacemaker industries. This area offers a choice between completing a six credit hour thesis and successfully defending it in an oral examination format or the satisfactory completion of a six credit hour internship in a clinical setting [480 hours] and taking a comprehensive oral examination to complete their course of study.

Required courses, restricted electives, and related requirements for each area of emphasis are detailed in **Appendix I. Table 1** summarizes faculty data.

2. **Faculty:**

**Table 1. Five-Year Descriptive Data (1999-2003)**

| Name              | University Rank     | Degree | Tenure | Grad/Faculty Status | Pubs. 5 Years | External Funding |
|-------------------|---------------------|--------|--------|---------------------|---------------|------------------|
| William P. Marley | Professor           | Ph.D.  | Yes    | Full                | 16            | \$390,800        |
| Terry A. Shepherd | Professor           | Ph.D.  | Yes    | Full                | 3             | N/A              |
| R. Daniel Martin  | Associate Professor | Ed.D.  | Yes    | Full                | 2             | \$115,000        |
| T. Jeff Chandler  | Associate Professor | Ed.D.  | Yes    | Full                | 6             | \$120,000        |
| Eric J. Clausen   | Assistant Professor | M.S.   | No     | Graduate Instructor | NA            | NA               |

The Exercise Science Graduate Program faculty [**Table 1**] consists of two [2] full professors, two [2] associate professors, and one [1] part-time Assistant Professor. Three are tenured and a fourth is preparing for tenure application. Their *Faculty Data Sheets* are listed in **Appendix II**. The curriculum includes successful collaboration with faculty at the Medical Center as well as in Educational Statistics and Counseling for courses and clinical practicums. Students have also taken elective courses (e.g., medical sociology, business courses, pharmacology, emergency medical technician, Advanced Cardiac Life Support [ACLS], electrocardiogram beginner and advanced levels) in other departments. Faculty members are highly trained and well-prepared in exercise science and allied health. Dr. Marley, Director of the Graduate Exercise Science Program and the Human Performance Laboratory, has been recognized on a

national level for his accomplishments in these and related areas. He has published more than 60 professional articles, a textbook that received an endorsement by the American College of Sports Medicine, and numerous handbooks and technical manuals. In the past five [5] years, he has published 16 articles and five [5] of his 33 professional papers have been presented at international conferences and four [4] at national meetings. One of his articles, a 15-year study that examined a rare case of rheumatoid vasculitis and that was published in a peer-reviewed medical journal, was selected by an international medical panel to be included in a special issue of the *Rheumatology Review Series* of eight [8] rare and exceptional clinical case reports from around the world. One does not apply for this honor.

He previously has been accorded Fellow status by the American College of Sports Medicine [FACSM] and the American Association of Cardiovascular and Pulmonary Rehabilitation [FAACVPR] as well as serving on the Board for the latter Society. He has received the prestigious Healthy American Fitness Leader Award, presented by the President's Council for Physical Fitness and Sports. He has received a Career Achievement Award from the American Heart Association (AHA) for his many contributions to the AHA including serving as President of the Cabell-Wayne (WV) Regional Heart Association for five (5) years. He has also been recognized in the publication, "*Who's Who in Diabetes Treatment, Education & Research*" for the past eight [8] years by the American Diabetes Association (ADA). A listing of Dr. Marley's externally funded contracts and grants for the past five [5] years follows:

#### **Project Director and Principal Investigator**

- Cabell Huntington Hospital/MU Medical Center Rehabilitation Program [CHH/MUMCRP: 1997 – present]  
 This contract was initiated in 1997. It generates \$42,000 in revenue annually and supports The Diabetes Exercise Center [DEC], Cardiac Rehabilitation Program [CRP], and Chronic Pain Management Program [CPMP]. The DEC is one of a kind in the country and is part of the CH Diabetes Treatment Center, an ADA certified center. The CRP continues to maintain its national certification by the AACVPR, having been the first such program in West Virginia to be so certified. The DEC, CRP, and CPMP accumulate more than 10,000, 3,000, and 3,000 *patient contact-hours*, respectively, on an annual basis [Table 1A]. These programs also provide clinical practicum and internship opportunities for graduate students in Exercise Science, Physical Therapy, and Athletic Training. The Human Performance Laboratory [HPL] is one of a few labs in the country that provides students with opportunities to work under supervision in the clinical setting. This means they learn to develop exercise prescriptions, take BP's, read EKG's, check blood glucose readings, and make appropriate adjustments. These programs require mature and responsible behavior in managing patients with multiple medical problems. The opportunity to work in such a setting is immeasurable. Students benefit greatly by directly applying knowledge they have gained in the classroom.
- Johnson & Johnson Lifescan Clinical Site [1995 – present]  
 As a recipient of this competitive honor, the HPL receives blood glucose strips, lancets, glucometers, and related technological support as well as educational materials and support. This award amounts to \$4,000 annually.

- Huntington Medical Foundation [1998 -1999]  
The Foundation awarded a \$13,000 grant for support of the DEC. This money was applied to clinical profile development of our patients and the purchase of equipment.
- Teubert Foundation [1998 -1999]  
This \$147,000 grant was awarded to support DEC staff salaries, clinical diabetes research, and the purchase of equipment for the Human Performance Laboratory.

**Table 1 A. CHH/MUMCRP Patient Therapeutic Intervention Contact Hours**

| Program        | Annual Contact Hours | 5-Year Totals |
|----------------|----------------------|---------------|
| DEC            | 10,000               | 50,000        |
| CRP            | 3,000                | 15,000        |
| CPMP           | 3,000                | 15,000        |
| <b>Totals:</b> | <b>16,000</b>        | <b>80,000</b> |

As Director of the Human Performance Laboratory, Dr. Marley also serves as one Resident Supervisor for the *Primary Care Sports Medicine Fellow* in the **Marshall University Joan C. Edwards School of Medicine**. This Fellow is given the opportunity to observe the role of exercise therapy and related therapeutic lifestyle interventions in the treatment of patients with diabetes and cardiovascular disease as well as sports medicine applications in screening and treating athletes. This Fellow also assists the Cabell Huntington Marshall University Medical Center Rehabilitation Program with medical coverage for the Diabetes Exercise Center and Cardiac Rehabilitation Phase II and Phase III – Long-term Program. This includes assisting with multi-stage exercise testing and management of medical emergencies and patient care. Consultation and instruction is provided by the Resident Supervisor and Human Performance Laboratory staff.

Dr. Chandler is currently Chair for the Division of Exercise Science, Sport and Recreation [ESSR]. He is Editor-In-Chief of the *Strength and Conditioning Journal* and a nationally recognized expert in the field, having been certified as Strength and Conditioning Specialist with Distinction [CSCS\*D]. He has also been accorded Fellow status by the American College of Sports Medicine [FACSM]. As examination of his Faculty Data Sheet in Appendix II shows, he has an extensive record of research, publication, and professional presentations. The courses he teaches, particularly PE 670 [required] and PE 642 [restricted elective], are important curricular components. He also serves as a valuable source for thesis and internship advisement. Another valuable contribution to the Program is his guidance and advice to those students preparing for the certification, Certified Strength and Conditioning Specialist [CSCS], an increasingly attractive option for our students.

Dr. Martin is a Certified Athletic Trainer who is Director of the Athletic Training Education Program at Marshall University. His program has been certified by the prestigious National Athletic Trainers' Association. In addition to a full teaching and advising schedule in the Athletic Training curriculum, his responsibilities include supervision of an extensive network of clinical internship sites where his graduate and undergraduate students are assigned for their clinical experiences. Dr. Martin has been successful in obtaining more than \$100,000 in funding from four outside agencies to support this network. He is an experienced sports medicine clinician who is also professionally active as a speaker and was recognized in *Who's Who Among American Teachers* in and 2002. His contributions to the Exercise Science Graduate Program include teaching PE 687, Advanced Cardiac Life Support, HE 540 and HE 640, Level 1 and Level 2 Health Assessment, respectively, and assisting with final comprehensive oral examinations. The Exercise Science Program and HPL also collaborate with Dr. Martin in providing clinical rotation experiences for his Athletic Trainer students, an important part of their education and certification process.

Dr. Shepherd is Director of the Exercise Physiology Undergraduate Program at Marshall University. This program has become one of the most popular curriculums at the University since he assumed this responsibility. He has also developed the Exercise Physiology Laboratory that serves as the base for his research in metabolic systems and its application to the development of fitness norms for the schoolchildren of West Virginia as well as training graduate and undergraduate students. He has lectured extensively in these and related areas.

His scientific expertise is especially evident in a major project he is presently undertaking, **High Intensity Training [HIT] Centers, Incorporated**. Dr. Shepherd is President and CEO of this cutting-edge performance enhancement corporation and he has established HIT Centers in Huntington [WV], Lexington [KY], Jacksonville [FL], Spokane [WA], Brandon [FL], and Denver [CO]. HIT Centers are presently being developed in Clearwater [FL], San Diego [CA], Sewickley [Pittsburgh/PA], Morgantown [WV], Greensboro [NC], and Charlotte [NC]. A HIT Center Corporate Center for Development and Staff Certification is currently being built in Columbus [OH].

Because of his new corporate responsibilities and extensive travel schedule, Dr. Shepherd has been on part-time status beginning with the 2003 Spring Semester, teaching one class per semester. His contributions to the Exercise Science Graduate Program have included managing the Exercise Physiology Area of Emphasis, teaching PE 621, PE 578, PE 601, PE 586 [please see Appendix I for course titles], directing thesis projects, and assisting with final comprehensive oral examinations. He has also been sharing his expertise as a guest lecturer in PE 670 and PE 685 and providing excellent internship and employment opportunities for our students in his HIT Centers.

Mr. Clausen is currently serving as an Assistant Professor and Graduate Instructor on an interim basis to assist us in teaching some of the classes normally managed by Dr. Shepherd. As noted above, Dr. Shepherd is currently on part-time status. In the meantime, Mr. Clausen has become a valuable member of our faculty.

### 3. Students:

- a. Entrance standards: Full admission to the Master of Science program for Exercise Science requires a 3.00 GPA, completion of the GRE, a personal interview, three (3) letters of reference, and admission to the Marshall University Graduate College.
- b. Entrance abilities: Students are required to take the GRE. Standardized tests for identifying the specialized abilities of incoming students are not presently available. As the data in **Table 2** [next page] indicate, however, Exercise Science MS candidates compare favorably with those entering other COEHS Programs.

**Table 2. GRE Score Summaries**

| <b>ES MS</b>             | <b>GRE<br/>VERBAL</b> | <b>GRE<br/>QUANT</b> | <b>GRE<br/>ANALYTIC</b> | <b>GPA<br/>Undergrad</b> |
|--------------------------|-----------------------|----------------------|-------------------------|--------------------------|
| <b>Overall<br/>98-02</b> | <b>392.89</b>         | <b>473.16</b>        | <b>511.62</b>           | <b>3.21</b>              |
| <b>COEHS</b>             | <b>GRE<br/>VERBAL</b> | <b>GRE<br/>QUANT</b> | <b>GRE<br/>ANALYTIC</b> | <b>GPA<br/>Undergrad</b> |
| <b>Overall<br/>98-02</b> | <b>407.25</b>         | <b>438.49</b>        | <b>486.51</b>           | <b>3.00</b>              |

- c. Exit Abilities: There is no standardized licensure procedure for Exercise Science Program graduates. Those completing an internship are, however, required to take a comprehensive oral examination in the presence of a select faculty committee and those writing a thesis must defend their completed study in similar fashion.

Although there are no existing national standards for Exercise Science graduates, many have completed the requirements for certification as *Exercise Specialist* by the American College of Sports Medicine, competing very favorably with students from other programs across the country. All of our students are required to be certified as *CPR Healthcare Providers with Automatic External Defibrillator* [AED] certification by the **American Heart Association [AHA]**. All of our students are required to take PE 687 *Advanced Cardiac Life Support [ACLS]*, a preparatory class as part of their curriculum. Recently, all of our students in the *Clinical Applied Area of Emphasis* have also successfully completed **AHA ACLS** class and certification prior to their internship, an important professional achievement and qualification in the clinical setting.

#### 4. Resources:

##### a. Financial:

Funding for the Exercise Science program is provided from an allocation received by the Division of Exercise Science, Sport, and Recreation [ESSR] from the College of Education and Human Services. Graduate Assistantship waivers are funded by the Marshall University Graduate College. A full-time faculty position was awarded to the program at its initiation by the University.

Supportive funding from external sources has also been obtained: revenue derived from the Cabell Huntington/ MU Medical Center Rehabilitation Program contract discussed in **Section A. 2.** is dedicated to maintaining HPL facilities, equipment, and services. This includes purchase of exercise and clinical laboratory equipment, telecommunications and computer support as well as renovating and improving educational facilities in the HPL and classroom. This contract also funds a \$6,000 Graduate Assistantship for the ESSR and HPL. The Johnson & Johnson Lifescan Clinical Site grant provides approximately \$4000 annually to our Diabetes Exercise Center in the form of blood glucose strips, lancets, glucometers, and related technological materials as well as educational materials and support.

Should this program be terminated, the allotted full-time position would be eliminated as would the commitments of the other four (4) faculty positions. The commitments of Cabell Huntington Hospital/MU Medical Center Staff, including two [2] Clinical Exercise Physiologists, a Registered Nurse, and Registered Dietitian would be affected. Five Graduate Assistants would be denied the opportunity to obtain valuable clinical experience and achieve their educational goals

The external funding supporting the Diabetes Exercise Center [DEC], Cardiac Rehabilitation Program [CRP], and Chronic Pain Management Program [CPMP] would be lost to the university. Services to the Tri State community, amounting to a total of more than 16,000 patient contact hours annually, would be lost. Collaborative support efforts with the Cabell Huntington/MU Medical Center Diabetes Treatment Center, Cardiac Rehabilitation Program, and Chronic Pain Management Program would be eliminated. This includes lectures to patients and support groups. The Marshall University Sports Medicine Department would be denied a training site for their Sports Medicine Fellow and they would no longer have HPL support in screening athletes with potentially serious medical concerns. The latter service would be denied to the Tri-State sports medicine community as well. The Athletic Training Program would be

denied a popular and important clinical site for their students.

Similarly, commitments to one medical contract and one grant could not be kept. More importantly, an established program with successful graduates making substantial contributions to allied health in the region and in an ever expanding area across the country would be lost.

#### **b. Facilities:**

The Human Performance Laboratory and Exercise Physiology Laboratory play integral roles in the Exercise Science program with their state-of-the-art facilities and equipment. Students participate in all phases of medical profile and performance assessment testing. This includes opportunities to work with and manage patients being treated for diabetes, cardiovascular disease, obesity, and asthma as well as individuals seeking fitness testing and personal exercise program counseling and performance enhancement. Management strategies and techniques include multi-stage exercise testing, blood glucose determinations, blood pressure measures, EKG analysis, lipid profiles and related bloodwork, anthropometric assessments, and metabolic measures to determine physical work capacity.

With the assistance of the College of Education and Human Services and the University Computer Center, a Computer Learning Center has been established in the HPL for student and staff use. Additionally, a website - [www.marshall.edu/coehs/hpl](http://www.marshall.edu/coehs/hpl) - has been established and an LCD Power Point projector with an online Internet computer has been installed in the HPL classroom. These projects have had significant impacts in HPL programs and the classroom.

### **5. Assessment Information:**

#### **a.1. Student performance is assessed in the following ways:**

- (1) Routine examination procedures and writing assignments in each course.
- (2) Students are evaluated on their performance in research projects, class workshop assignments, class presentations, independent studies, practical exams, class staff meetings, case study presentations, presentations to their classmates, to medical center programs, and community groups.
- (3) Their performance in the internship and their thesis preparations are major considerations.
- (4) A student's performance in his/her assignment as a Graduate Assistant is observed. These students, as well as those not serving as Graduate Assistants, are also observed in the classroom. Particular

attention is devoted to their progress in developing the *clinical attitude* and the *scientific attitude* as discussed in the introductory narrative.

(5) Students are required to have a minimum 3.0 GPA prior to their internship assignment.

(6) A comprehensive oral examination must be passed in the presence of a graduate faculty select committee prior to graduation.

#### **a.2. Program quality is assessed in the following ways:**

(1) The Program is reviewed annually by the Marshall University Office of Program Review and Assessment

(2) Students evaluate professors at the completion of each course.

(3) Students evaluate course content at the completion of each course.

(4) The Division Chair evaluates faculty teaching advising, scholarly activity, university service, and community service annually.

(5) Dialogue with program graduates and their employers as well as extensive input from internship supervisors and a growing network of ES program graduates permits feedback for evaluating program content and effectiveness.

(6) Involvement with the Centers for Disease Control, the American Association for Cardiovascular & Pulmonary Rehabilitation, American Diabetes Association, the American College of Sports Medicine, the National Association of Trainers, the American Heart Association, and collaboration with the conference planning committees and grant applications for the School of Nursing and Health Professions keeps the faculty apprised of clinical standards and guidelines for excellence in medicine and allied health that includes health promotion, disease prevention, and rehabilitation.

(7) Our involvement with the Diabetes Treatment Center Education Program – we collaborate by exchanging speakers for our respective programs and for Grand Rounds.

(8) A systematic review of the medical literature permits us to be informed of current medical opinion and incorporate same into the program [e.g., Adult Treatment Panel III, The Metabolic Syndrome, The JNC VII Report, emerging cardiovascular disease risk factors].

(8) With the addition of Dr. Chandler and his prestigious position as Editor-in-Chief of the *Strength and Conditioning Journal*, we now have the benefit of his expertise and extensive involvement with and access to this and aligned areas. This also provides another area of certification for our students.

#### **b. Assessment of Student Outcomes [Chart I]**

**Chart I Assessment Summary** in the **APPENDIX** provides a detailed summary of student outcomes. **Assessment Tools, Standards and Benchmarks, Results and Analyses**, and subsequent **Actions Taken**

are presented. An examination of **7. Technical Skills** in **Chart I** demonstrates one application of our outcome assessment.

*Verification procedures* [**Assessment Tool**] for teaching students the procedure for blood pressure [BP] measurement utilize a teaching stethoscope that permits faculty to monitor the accuracy of student BP measures. A *Verification record* [**Standards/Benchmarks**] is maintained until an appropriate *Clinical skill level is achieved* [**Results/Analysis**]. When a student is considered qualified to monitor BP, they are given a *Clinical assignment* [**Action Taken**] as a staff member.

**c. How assessment data is used to improve the program:**

(1) An ongoing program of self-appraisal by the faculty includes verbal and written observations by students during exit interviews as well as by internship supervisors and the other sources noted in Sections 5.a. and 5.b. Five [5] specific examples from the past 5 years illustrate direct applications for improving program quality. They include:

- ✓ the Human Performance Laboratory Internet Website
- ✓ installment of an on-line [Internet] computer with LCD Power Point applications in the HPL classroom
- ✓ the application of innovative teaching strategies
- ✓ the Human Performance Laboratory Computer Center
- ✓ Established Senior Clinical Exercise Physiologist [CEP] Graduate Assistant position

**I. Human Performance Laboratory Website**

<http://www.marshall.edu/coehs/hpl>

This site has been developed for student recruitment and instructional purposes and is always a work in progress – the most recent revision was on September 5, 2003. Extensive efforts have been directed to digital imaging and editing that includes both still and moving image clips. The graduate exercise science program is listed and discussed along with primary program objectives. The Alumni Section serves as a networking tool.

Philosophical professional perspectives are also presented. Other items include site and program overviews, a contracts and grants section with a special section illustrating our American Diabetes Association certified Diabetes Exercise Center, selected publications and professional presentations, and a listing of recent masters graduates. Some images illustrate our Cardiac Rehabilitation Program that is certified by the American Association of Cardiovascular and Pulmonary Rehabilitation.

Numerous links have been established with medical, professional, educational, and scientific organizations. This includes the American

College of Sports Medicine, the American Medical Association, the Surgeon General's Office, the National Institutes of Health, Agency for Health Care Policy and Research, the Cleveland Clinic, Duke University Medical Center, Stanford University Medical Center, Cabell Huntington Hospital, Charleston Area Medical Center, American Heart Association, American Diabetes Association, and American Cancer Society. These links can be used by students for class projects. Medical and allied healthcare professionals as well as students from across the USA and across the world have viewed this page.

This site is listed on the College of Education and Human Services webpage at: <http://www.marshall.edu/coehs/hpl> Viewers can communicate with Dr. Marley through an instant email function on the facing page. Here are selected comments on the website from questionnaire responses by graduates and their employers:

- ✓ "Well done on the web page!! I am impressed."
- ✓ "The web site is very user friendly, very easy to follow....loaded with information valuable to the prospective student, graduate, and fellow clinicians....Looks terrific."
- ✓ "Site looks great."
- ✓ "I think your site is nicely laid out and contains the right amount of information. Keep up the good work with your students...."
- ✓ "Your website...looks excellent."
- ✓ "I was really impressed by the program web page."

## **II. Installment of an on-line [Internet] computer with LCD Power Point applications in the HPL classroom**

This new application has become a valuable instructional tool and is used by professors for class instruction, oral examinations, and Grand Rounds presentations. It is also used for the weekly sessions of the Diabetes Education Program, Cardiac Rehabilitation Program, and Pulmonary Rehabilitation Program.

## **III. Development and incorporation of new and innovative teaching strategies and instructional technology into existing courses**

- ✓ Continued the implementation of computer laboratory and instructional units in PE 670, 682, 683, 684, and 685. This includes cardiology quizzes on the Internet.
- ✓ Implemented new applications of Power Point in the above classes. This included individual student and student team Power Point presentations.
- ✓ Established a workshop format that permits students to learn problem-solving and to apply critical thinking principles with carefully structured strategies in a team-oriented atmosphere.

#### IV. Human Performance Laboratory Computer Learning Center

- ✓ *The Center* has 3 computers and a dedicated area. It is used daily for clinical program management and student learning experiences.

#### V. Senior Clinical Exercise Physiologist [CEP] Graduate Assistant

- ✓ This \$6000 GA position is funded by Cabell Huntington Hospital [CHH] and is awarded on a competitive basis. This stipend is greater than the usual amount awarded to our students and Dr. Marley negotiated it with CHH in an effort to counter the loss of highly qualified students applying to our program. We have lost several students to ostensibly more prominent universities because they obtained assistantships with stipends of \$8000 or more – the most recent losses were to Tennessee and Wake Forest. Our students have competed exceptionally well with graduates of these and other institutions across the country for internships, professional positions, ACLS certification, and American College of Sports Medicine certification [Tables 7, 8, and 9].

#### d. Graduate and Employer Satisfaction:

##### Graduates:

Responses from over 50 recent graduates indicated that 92% of them felt they were, “significantly well-prepared,” -the highest rating, to “well-prepared,” by their graduate curriculum and related experiences in the Exercise Science Program [Table 3]. Many have competed successfully with candidates from other major universities for positions regionally and across the country [See Table Graduate Employment Sites C. 2. ].

**Table 3. How Well Were You Prepared for Employment by the Exercise Science Curriculum? [N = 53]**

| Significantly Well Prepared | Well Prepared | Marginally Prepared |
|-----------------------------|---------------|---------------------|
| 31                          | 18            | 4                   |

Students who rated themselves “marginally prepared” by the program for their current profession did so primarily because they changed careers. In every case, however, their training in the Graduate Exercise Science Program curriculum set the stage for and provided the opportunity for their new careers in allied health professions:

- ✓ Pharmacy [Pharm. D.] at West Virginia University
- ✓ Cardiology Programmed Electrophysiology Specialist
- ✓ Physician Recruiter, Healthcare Provider Corporation
- ✓ Elementary Physical Education Teacher

### Employers:

One of our most useful assessment tools for determining the effectiveness of our program and the quality of our graduates is the *Internship Evaluation Form*. It provides a wealth of information that is useful in program development as well as the counseling and guidance of our students. **Table 4** provides a summary of the number of graduate internships completed in the past five (5) years.

**Table 4. INTERNSHIP SUMMARY  $\Sigma=53$**

| Year   | 1999 | 2000 | 2001 | 2002 | 2003 |
|--------|------|------|------|------|------|
| Number | 12   | 12   | 6    | 14   | 9    |

Every student, with one [1] exception, was graded either Superior or Definitely Above Average, the two [2] highest ratings on the following item:

**“OVERALL QUALITIES:**  
**OVERALL PERFORMANCE** is your general evaluation of the intern’s work as it relates to their total job performance.”

With one exception, every internship supervisor also answered the following question in the affirmative:

**Based on your association with this student, would you consider recommending him or her for employment if a position were available in your agency?** The answer to this question assumes no commitment on your part. It is merely a part of our evaluation process.

One Director of a large regional Cardiac Rehabilitation Program commented, “Thanks again for sending us such well prepared interns....”

In many instances, internship site supervisors have been instrumental in obtaining employment for interns, either at their center or facilities and institutions with whom they are affiliated. Many of these supervisors have become valuable resources, both for employment of our graduates and

as an **informal advisory board** for the Exercise Science program. Some serve in another valuable role as guest lecturers, providing invaluable insights and guidance to our students as they prepare to launch their professional careers.

Seventeen [17] responded to our recent Employer Survey. Their responses to the question, “How do you rate the overall quality of these graduates in your employment during the past five [5] years?” are summarized in **Table 5** and show that all graduates [100%] in their employ were rated Superior to Above Average. The **academic preparedness** of these same students for employment [**Table 6**] was rated

**Table 5. Quality of MU Exercise Science Graduates In Your Employment**

| Above Average | Superior |
|---------------|----------|
| 10            | 7        |

Significantly Prepared to Extremely Prepared by 15 of 17 [88%] respondents to my survey of employers. The student rated “very unprepared” was considered of “Superior” quality, with no explanation given for the disparity. This may have been an employer of one of our 4 students changing careers discussed earlier.

**Table 6. How Well Were MU Exercise Science Graduates Prepared for Employment**

| Very Unprepared | Somewhat Unprepared | Significantly Prepared | Extremely Prepared |
|-----------------|---------------------|------------------------|--------------------|
| 1               | 1                   | 6                      | 9                  |

## 6. Previous Reviews:

Our 1998-99 Program Review Board of Trustees Report resulted in the University System of West Virginia Program Review Committee approving continuation of the Graduate Exercise Science Program. Dr. Robert F. Edmunds, Coordinator, Program Review and Assessment, stated, “The department is commended for an excellent assessment program.”

Our 1993-94 Program Review BOT Report resulted in the Graduate Professional Degree Program Review Committee for the University System of West Virginia approving continuation of the Graduate Exercise Science Program. Dr. Bruce C. Flack, Director of Academic Affairs, stated, "The committee concurs with the institutional recommendation to continue at the current level of activity. The Division is commended for providing a well prepared report."

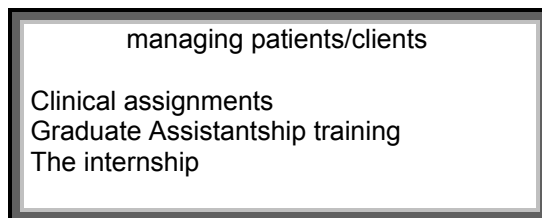
## 7. Strengths/Weaknesses:

### a. Strengths:

More than fifty [50] graduates responded to Dr. Marley's recent survey questionnaire. They were requested to, "Please identify aspects of the Exercise Science Program that were the most valuable in the academic preparation for your professional position. This could include specific courses, an internship, and graduate assistantship experiences, research, faculty, or other items." **Table 6A** summarizes comments from their responses that included the faculty, course and curriculum content, graduate and internship experiences.

**Table 6A. Selected Comments:  
Questionnaire Responses  
Citing Most Valuable Aspects of  
Student Academic Experiences**

|  |
|--|
| <p>Clinical expertise of professors<br/>Quality of Exercise Science Professors<br/>Their charisma and passion to teach<br/>Thoroughness in covering material<br/>Experienced, knowledgeable, faculty<br/>The caring and compassionate faculty<br/>Availability of faculty<br/>Professors went above and beyond<br/>Dr. Marley and Dr. Shepherd are<br/>top-notch educators</p> <p>Coursework and curriculum plan<br/>Emphasis on the scientific literature<br/>In-depth scientific literature &amp; research<br/>emphasis in all classes<br/>The integration of research and<br/>current opinion into courses<br/>Clinical application of course material</p> <p>Case study/medical profile approach<br/>Carefully structured strategies for</p> |
|--|



The program has been strengthened by the changes described earlier in Section 5.c. [*How Assessment data is used to strengthen the program*]

These changes are the direct result of input by graduates, internship supervisors, and employers. The curriculum is achieving its objectives of preparing students for careers in the clinical, community, corporate and commercial settings and enabling them to achieve success in their allied health careers. Their positions include health promotion, disease prevention, rehabilitation, wellness, and related research projects in allied health. Strong documentation from medical directors, clinical directors, administrators and internship supervisors indicates that employers are impressed with the quality of our students - they have demonstrated good clinical knowledge and preparation compared to masters level graduates from other programs they have interviewed.

The Director of the largest cardiac rehabilitation program in this region, Charleston Area Medical Center, has hired eight [8] of our graduates and requests three (3) interns each semester because he is impressed with the quality of our Exercise Science Program graduates. He is pleased with their responsible attitude and finds them well-prepared and knowledgeable. He recommends them highly to other cardiac rehabilitation programs when he cannot offer them employment or provide them with an internship.

As witnessed by the faculty credential forms, students receive instruction and guidance from well-prepared and highly trained faculty and benefit from an agreement with the School of Medicine that permits a Sports Medicine Fellow to serve as Medical Director of the Human Performance Laboratory (HPL) and Exercise Physiology Laboratory (EPL). The Exercise Science program includes these two well-equipped laboratories with state-of-the-art equipment. One lab (EPL) specializes in metabolic measures and research that includes work with fitness, body composition, obesity, and performance enhancement. The other lab (HPL) specializes in medical profile testing, cardiovascular and metabolic research, and includes a diabetes program, cardiac rehabilitation program, and chronic pain management program supported by a contract with the Marshall University Medical Center and Cabell Huntington Hospital. Students gain valuable experience by assisting in all of these programs.

**Table 6B** [next page] lists some comments from employers in response to the following query on the EMPLOYER SURVEY, "What suggestions do you have that, in your opinion, would enhance the quality and performance of these graduates?"

**Table 6B. Selected Employer Responses to: What suggestions do you have that, in your opinion, would enhance the quality of these graduates?**

"Keep up the program you now have."  
 "Graduates are very well prepared.... We greatly appreciate the Graduate Exercise Science Program at Marshall."  
 "None known."  
 "None."  
 "I have been very pleased...."  
 "Your graduate assistants, especially, appear to be very well prepared for clinical practice."  
 "The graduate is hard working and a valued member of our staff."  
 "The quality is excellent....I would like to see more of your students as interns at our center."  
 "The graduates I have employed...have been a positive contribution to our business from day one. These students...raise the bar....[please] continue to move forward with your program, for the benefit of the students and the fitness industry."

b. Weaknesses:

Similarly, the questionnaire cited in 7.a. above included responses to, "What are some of the aspects of the graduate program which could be modified/improved?" More than fifty [50] graduates responded. Again, this could include specific courses, an internship, and graduate assistantship experiences, research, faculty, or other items. **Table 6C** summarizes recommendations for program modifications or improvements.

**Table 6C. Graduates and Employer Suggestions For Program Modifications/Improvements With Dr. Marley's Responses Regarding Implementation**

Consider more emphasis on pulmonary rehabilitation strategies and management.  
 ✓ Response: this has been implemented into PE 683 and PE 601  
 Go a little deeper into exercise physiology and biochemistry.  
 ✓ Response: This request is being incorporated into individual student and student -team projects and includes computer applications.

Add more work on writing exercise prescriptions and modality skills instruction.

- ✓ Response: This is always a work in progress and is being addressed with class workshop assignments and case study assignments.

Add a sports injury management class.

- ✓ Response: Classes are available with Dr. Martin, but students may not be able to work them into their academic schedules without significantly exceeding their degree credit hour requirement.

Require more hands-on work for those who are not graduate assistants and/or not in the region, or close to campus. I should have assisted more with exercise testing and related clinical opportunities in the lab.

- ✓ Response: A staff member has been assigned the responsibility of scheduling laboratory experiences for graduate students motivated to take advantage of these opportunities to learn exercise testing, metabolic analysis, anthropometric measurement skills, and related technical skills. Blood pressure measurements, EKG interpretation, blood glucose measurement training opportunities are always available for scheduling under supervision in the Diabetes Exercise Center and Cardiac Rehabilitation Program.

Provide a pharmacology class.

- ✓ Response: A pharmacology class is available in the medical school and some of our students have successfully completed the course. It is available for those students able to fit it into their Plan of Study. There is also an increased emphasis on jargon, terminology, and medications in each class, especially PE 682, 683, 684, 687, and 578.

Consider multiple internship rotations

- ✓ Response: This opportunity is available for those students willing to put the time and effort into planning such an experiment. We also have opportunities for clinical site visits unrelated to the internship.

Place even more emphasis on clinical patient outcomes.

- ✓ Response: This concern has been implemented into our classes. Additionally, we have implemented the Orion System Benchmark Outcome System into our Cardiac Rehabilitation Program and students can observe this in action. This includes an emphasis on defining and equating procedures and events

Include more epidemiology in our classes.

- ✓ Response: PE 682 includes a strong emphasis in this area, but each class has similar epidemiological and outcome applications.

Oral exam was extremely difficult to prepare for.

- ✓ Response: We have made significant revisions in this area, including a restructuring of the final oral examination that permits students to prepare in a more meaningful fashion for this important event in their program.

The Research Methods course could be improved.

- ✓ Response: We have made significant changes in this course. They include more targeted involvement of the two disciplines and a more practical approach to research and the publication process.

Spend more time on preparing students in the development, management, and administration of preventive medicine and rehabilitation programs.

- ✓ Response: Accordingly, this has received an increased emphasis in our curriculum on leadership roles, including repeated applications of policy and procedure, screening, risk stratification, and client/patient management.

Add a course in communication skills. Although experience is the ultimate teacher, some graduates need preparation in this area, especially when beginning their careers.

- ✓ Response: This concern is receiving an increased emphasis with assignments managing contrived critical incidents, short unrehearsed presentations to their classmates, role playing, and team workshop assignments with rotating

leadership responsibilities.  
 Raise the standards for program entry.  
 ✓ Response: This is currently being addressed and assumes increasing importance because of program popularity. Class sizes are becoming larger, Our concern is to maintain reasonable class size to insure adequate individual student attention, a program staple.

As shown above, **Table 6C** summarizes responses relevant to program weaknesses cited by graduates. In brief, a synthesis:

(1) A need for more and varied clinical experiences in addition to the internship.

Our contract with Cabell Huntington Hospital and the Marshall University Medical Center provides for a lease agreement that supports the Diabetes Exercise Center [part of The Medical Center Diabetes Treatment Center – certified by the American Diabetes Association], Cardiac Rehabilitation Program [certified by the American Association for Cardiovascular & Pulmonary Rehabilitation], and Chronic Pain Management Program. These programs provide substantial clinical opportunities for our students.

(2) A need for more experience in exercise testing and performance assessment.

A staff member has been assigned to provide opportunities for students to remedy this concern. A course, PE 601, was added and PE 683 provides more emphasis in these areas. External funding has permitted the purchase of a state-of-the-art EKG and compatible programmable treadmill, an EKG station for monitoring eight [8] patients simultaneously, and an excellent rehabilitation exercise facility with a state-of-the-art oximeter, Orion Outcome System, and blood glucose monitoring technology that will further assist us with this task.

**Table 6D** includes additional selected comments from graduate responses to this item.

**Table 6D. Additional Comments:  
 Questionnaire Responses From Graduates  
 Suggesting Program Modifications/Improvements**

Absolutely nothing! This program is well-rounded and provides many experiences to learn more and become well-rounded in the field. If you take advantage of what they have to offer, you will be well-prepared for anything.

Dr. Marley and staff gave me the knowledge and confidence...to excel in my internship

and in the workplace....Many of the skills and practices I learned in Exercise Science classes, I use daily on the job in cardiac rehabilitation....I believe I made an easier transition to my job at the Cleveland Clinic than most of my colleagues from other institutions....I could not offer...suggestions for modifications or improvements at this time.

It is because of this program that I am currently in the Physician Assistant Medical School at the University of Kentucky.

Thanks for all your help and guidance over the past few years.

I believe our program prepares students to enter the clinical setting with superior knowledge and confidence. I can never thank you enough....

Great program.

The course work was excellent preparation for professional development.

An excellent program to prepare for any allied health field.

The program offers great 'hands on' opportunities to students – it is definitely the strong point of the program and should remain so. This separates our program from others....

I have fond memories of my academic career and recommend the program to others. I believe our students are well-prepared and superior to similar programs. Thank you.

## B. VIABILITY:

### 1. Off-Campus Classes:

No off-campus classes have been offered to date. **Appendix III** is N/A.

### 2. Service Courses:

There are currently no Exercise Science courses required for majors outside the Division. Some students from other majors (e.g., School of Nursing) do, however, enroll in selected courses. Students in other areas of concentration of the Division are required to complete selected courses in the Exercise Science curriculum. This includes those pursuing a Master of Science degree in Health and Physical Education, a degree that includes specializations in physical education or athletic training. **Appendix IV** is not applicable.

### 3. Articulation Agreements:

There are no current program specific articulation agreements with other institutions of higher education. There is, however, an agreement with Cabell Huntington Hospital and Marshall University Medical Center and a lease agreement which supports the Diabetes Exercise Center, Cardiac Rehabilitation Program, and Chronic Pain Management Program. This provides opportunities for graduate assistantships, student internships and

clinical rotations. It also provides fine clinical services to the community.

**4. Program Course Enrollment:**

List program area courses taken by students who are majors and include enrollment by semester for the past five years. Indicate required or elective courses. See **Appendix V**.

**5. Program Enrollment:**

As **Appendix VI, VI-A**, and the **VI-A Figure** histogram show, the number of Exercise Science graduates has grown by 152% since inception of the program in 1988. This includes an increase in graduates of 26% since 1998. We have reached our capacity for managing the number of students enrolled with our current faculty size, our equipment, and our facilities.

**6. Enrollment Projections:**

The observed enrollments for the past fifteen-year period and the most recent five-year period [i.e., **Appendix VI, VI-A**, and the **VI-A Figure**] are equivalent to +100% and +26% increases in program graduates for the past two five-year reporting periods, respectively. The increase in enrollment for the 15-year period since inception of the program to the present is 152%. This increase would seem to demonstrate great interest in the Exercise Science program and confidence in our record of placement that reflects a change in health care from treatment-oriented medical approaches and their sky-rocketing costs to an emphasis on health promotion and disease prevention focusing on primary and secondary prevention - the number of wellness, preventive, and rehabilitation programs in the region and the country is rapidly expanding. We, therefore, anticipate continued enrollment success despite the fact that we have become more selective with our applicants and have increased the rigor of the curriculum. **As indicated earlier, we are presently at program capacity for managing the number of students enrolled with our current faculty size, our equipment, and our facilities.**

**C. NECESSITY:**

**1. Advisory Committee:**

A formal Advisory Committee is not presently in place, but those centers, facilities and institutions providing internships and employment for our students are routinely requested to provide input for the Exercise Science program in their evaluations of our interns. We also now have a relatively extensive network with our graduates that provides substantial feedback

and support to the program in the form of student referrals, educational materials, and guest speakers. Please see **Section 5.d.** and **Tables 3, 4, 5, 6, 6A, 6B, 6C,** and **6D.**

**2. Graduates:**

Graduates are being placed in good professional allied health positions in their field at good salaries. Dr. Marley's survey of 53 Exercise Science graduates [**Table 7**] shows that 94% of them are employed In Field or an Allied Field.

**Table 7. Current Employment**

|                     | <b>Clinical<br/>Emphasis</b> | <b>EP<br/>Emphasis</b> | <b>Total</b> |
|---------------------|------------------------------|------------------------|--------------|
| <b>In Field</b>     | <b>22</b>                    | <b>13</b>              | <b>35</b>    |
| <b>Allied Field</b> | <b>10</b>                    | <b>5</b>               | <b>15</b>    |
| <b>Out of Field</b> | <b>2</b>                     | <b>1</b>               | <b>3</b>     |

Graduates [**Table 8**, next page] have obtained important staff and management positions in clinical, corporate, commercial, and community health promotion, disease prevention, rehabilitation, wellness, performance enhancement settings, pharmaceutical, and other allied health settings. They have also been successful in obtaining positions dedicated to clinical research and in obtaining external funding to augment their programs in the clinical setting.

**Table 8. Selected Titles: Current Positions for Exercise Science Graduates**

|  |
|--|
| Health System Planning Analyst Administrator [MS, MBA] |
| Director of Rehabilitation Services                    |
| Director of Cardiac Rehabilitation                     |
| Director of Sports Performance Enhancement Center      |
| Director of Fitness & Weight Loss Center               |
| Director, Cardiac, Vascular & Pulmonary Services       |
| Director, Corporate Wellness Center                    |
| Supervisor, Exercise Stress Testing Laboratory         |

Supervisor, Department of Cardiac Rehabilitation  
Head Athletic Trainer  
Strength and Conditioning Coach, Atlanta Braves  
Fitness Director, YMCA

Coordinator, Cardiac Rehab & Diabetes Exercise Center  
Coordinator Wellness and Preventive Medicine  
Coordinator, Therapeutic Lifestyle Intervention, M.D. Practice  
Staffing Coordinator, Physician Recruiter for Healthcare System

Clinical Exercise Physiologist  
Health and Wellness Specialist  
Personal Trainer

Pharmaceutical Sales Representative  
Pacemaker Sales and Management

Registered Dietitian, Cardiovascular Specialist  
Cardiac Rehabilitation Dietetic Specialist  
Clinical Dietitian

Physician Assistant  
Cardiology Electrophysiology Lab Technician  
Ph.D., Exercise Physiology  
Pharmacy Doctorate [M.S., Pharm. D.]  
Physician

Salaries range for initial positions from \$25,000 to more than \$75,000 as their careers progress. The salaries of some are augmented with an expense account, the provision of a vehicle, and opportunities for consultation and professional clients as well as fine benefit plans. Others have also become owners and entrepreneurs in the health and fitness industry with one graduate owning and managing two [2] fitness centers in addition to being director of a cardiac rehabilitation program in a medical center.

The doctorate is not a priority for Clinical Applied Area of Emphasis graduates. It provides no special opportunity for upward mobility and professional success in the clinical setting, except in research roles. Knowledge of the clinical literature and research interpretation and applications are valuable assets in all allied health disciplines and we, therefore, strongly emphasize the pursuit of scholarly excellence in both of these areas, along with clinical, technical and management skills. With the addition of an option for Exercise Physiology Area of Emphasis students [i.e., internship or thesis], some have taken employment in settings similar to those of graduates from the clinical program.

Our graduates have excelled in other areas. One Exercise Science graduate is currently President of the West Virginia Association for Cardiovascular & Pulmonary Rehabilitation and recently presented a research paper at the National Conference of the American Association for Cardiovascular & Pulmonary Rehabilitation in Kansas City. Another graduate was similarly honored recently as President of the Kentucky Association for Cardiovascular & Pulmonary Rehabilitation. Other graduates are professionally active across the region and the country.

### 3. Job Placement:

We have a successful record of placement. **Table 9** lists some of the sites employing Exercise Science graduates.

**Table 9. Some Employers of Exercise Science Graduates**

|  |                                  |
|--|----------------------------------|
| The Cleveland Clinic                               | Duke University Medical Center   |
| The Mayo Clinic                                    | Charleston Area Medical Center   |
| Cabell Huntington Hospital                         | Our Lady of Bellefonte Hospital  |
| University of Virginia Medical Center              | Nautilus Sports Fitness Centers  |
| Ohio State University Medical Center               | Dow Chemical Corporation         |
| Dayton Heart Center                                | Williamson Memorial Hospital     |
| The Atlanta Braves                                 | Carolina Cardiology Group        |
| Office of Strategy Planning                        | Howard Long Wellness Center      |
| HIT Centers, Incorporated                          | Dayton Sports Medicine Institute |
| Merck Pharmaceutical, Inc.                         | Pfizer Pharmaceutical, Inc.      |
| Guidant Pacemaker, Incorporated                    | Medtronic Pacemaker, Inc.        |
| Shady Grove Adventist Hospital[MD]                 | Carolina Cardiology, Inc.        |
| Huntington Physical Therapy                        | Boone Memorial Hospital          |
| Presbyterian Hospital [NC]                         | Solvay Pharmaceuticals, Inc.     |
| Waianae Coast Comprehensive Health Center [Hawaii] |                                  |
| Cabell Wayne Association of the Blind              |                                  |

Students are assisted in their search for professional positions by several methods:

- (1) Each student is required to establish a credential file that includes a current, updated, resume with the University Career Services Center. The Program Director personally assists them in their final resume edit and preparation of credentials.
- (2) Our developing network of internship facilities/institutions is becoming a valuable source of potential employers. Internship supervisors also support employment opportunities at aligned institutions or those in other

areas when they have no positions available. Many of our students are performing in such an outstanding fashion as interns that the host institutions are hiring them. This includes several appointments as Program Directors, Supervisors, and Coordinators [Table 8].

3) Current employers of graduates keep us informed of job openings. In some cases, we receive regular requests for referral of qualified applicants for available professional positions. Our referral and support literally insures employment for these candidates, because the employers have come to trust our judgment as well as the training and preparation of our graduates.

(4) Feedback from graduates themselves keeps us informed of job opportunities before they are officially announced. Our most recent hire, Clinical Exercise Physiologist position at the University of Virginia Medical Center, was facilitated by an Exercise Science graduate already in their employ. Needless to say, if the candidate did not have the credentials and could not satisfy the interview and application standards of one of the finest medical centers in the world, he would not have gotten the job. Our contact merely provided the opportunity.

(5) Students themselves have become aggressive in their job searches in the region as well other parts of the country. One of our recent graduates, a Registered Dietitian who completed her clinical internship at Swedish Medical Center in Seattle, Washington, was offered a position at that institution, but chose to return to a clinical position offered to her at the University of Hawaii, in her native state. The success of such fine students like this has paved the way for subsequent graduates.

(6) The Human Performance Laboratory Internet webpage is beginning to yield dividends as a vehicle for program recruitment as well as a source of potential employers. It includes an Alumni Section and Email capability.

(7) Exercise Science professors have professional networks and are also contacted by professional colleagues. Professor involvement in professional meetings and publications are other avenues of information for available employment opportunities.

(8) Students have access to career bulletins published by the following professional organizations:

- ✓ American College of Sports Medicine
- ✓ American Association of Cardiovascular & Pulmonary Rehabilitation

Contact is maintained with former students at professional meetings, by correspondence, Email, and telephone. My webpage is also an important vehicle for communicating with students.

#### **D. CONSISTENCY WITH MISSION:**

1. Commitment to high quality masters education.

This commitment of the Graduate Exercise Science Program [GESp] is

embodied in an emphasis on development of the clinical attitude, scientific attitude, and a final, all-encompassing, objective that nurtures careful, thoughtful, thorough, and responsible attitudes and work habits in the clinical professional setting.

- ✓ A *clinical attitude* includes an understanding and skill in applying carefully structured strategies in managing patients/clients. Respect for the patient/client is paramount:
  - “Ask not what disease the patient has, but, rather, what patient the disease has.” Sir William Osler [physician and scientist]
- ✓ A *scientific attitude* includes respect for clinical assessment and carefully obtained data, respect for well-taken heart rate and blood pressure measures as well as the most sophisticated medical procedures [e.g., coronary angiograms, ventriculograms].

Graduate and employer satisfaction discussed in the **ADEQUACY** section, the high rate of in-field employment of our **Graduates [NECESSITY]** and their subsequent professional success strongly suggest that we are succeeding.

2. Commitment to expand the body of human knowledge and achievement through research. Faculty for the GESP have accrued \$625,800.00 in grants and contracts the past five [5] years to support our program and related research. The table below summarizes our accumulated publications, papers, and professional development activities for the past five [5] years. Our research and related publications and presentations at professional meetings have had an impact in the areas of cardiopulmonary rehabilitation, strength and conditioning, athletic training, and performance assessment and enhancement.

**Table 10. Scholarly and Professional Activity**

| <b>Professional Publications<br/>[Number]</b> | <b>Papers,<br/>Presentations<br/>[Number]</b> | <b>Professional Development<br/>[Conferences]</b> |
|---|---|---|
| <b>33</b>                                     | <b>71</b>                                     | <b>87</b>   |

3. Commitment to society through public service. The contributions of the Diabetes Exercise Center, the Cardiac Rehabilitation Program, and the Chronic Pain Management Program to the health and well-being of Tri-State residents, as noted earlier, provide strong documentation for our service to these communities. These programs are improving the lives of Tri-State residents. It should also be noted that these programs are partly staffed by selected graduate students and this provides exceptional opportunities for their training as well as the training of other selected allied

health professionals and the application of knowledge learned in the classroom. This is a strength of the program.

4. Commitment to diversity in our student body.  
The GESP has included African Americans and students of Hawaiian descent as well as students from Korea, Japan, China, and South America. Curricular content also reflects diversity [e.g., African Americans are at greater risk for hypertension and diabetes]. Gender, socioeconomic, and age diversity are also given important consideration.
5. Commitment to assuring the integrity of the curriculum through maintenance of rigorous standards and high expectations for student learning and performance. We adhere to strict applications of student entrance criteria and demanding curricular standards [e.g., advanced physiological principles, medical profile interpretation, case management, risk stratification, EKG interpretation]. There is also an emphasis on leadership roles in allied health.
6. Commitment to rural health care.  
Here, the GESP excels with its curricular emphasis as well as the programs supported by our contract with CHH/MUMC that accumulates more than 16,000 *patient contact hours* annually: the Diabetes Exercise Center, the Cardiac Rehabilitation Program, and the Chronic Pain Management Program. As noted earlier, these programs also provide unique educational opportunities for our GESP students, in addition to fine clinical rotations and internships for athletic trainers, physical therapist assistants, and physical therapist majors. Educational opportunities are also provided for third and fourth-year medical students and our Sports Medicine Fellow. Papers presented at the **Centers for Disease Control Diabetes Translation Conferences**, **World Disability Congresses**, and the **First International Conference on Rural Aging** underline this commitment.

#### **CONSISTENCY WITH MISSION: FINAL COMMENT.**

Components of the GESP and related programs have been duplicated at centers in the region and across the country. As our students progress in their careers and assume positions of leadership, principles they have learned in the GESP curriculum are being implemented into health promotion, disease prevention, cardiac rehabilitation, sports medicine, and wellness disciplines. This includes medical profile testing, case development, patient screening, stratification, risk stratification, and other carefully structured patient/client management strategies. As well, GESP training is having a positive impact on the credentials and certification of our graduates. Examples are American College of Sports Medicine certification and Advanced Cardiac Life Support [ACLS] certification by the American Heart Association.

Our productive professional relationships with Counseling, Educational Research and Statistics, and the Marshall University Medical Center continues. Benefits include courses, clinical observations and training, participation in oral comprehensive examinations, and student consultations for professional career planning.

#### **IV. PROGRAM OF EXCELLENCE.**

##### **Distinction**

On the basis of feedback from graduates, their employers, and examination of faculty performance, we propose the *Graduate Exercise Science Program* [GESP] as one of **Distinction** and worthy of the **Designation of Excellence**. The curriculum received strong support in questionnaire feedback from both graduates and their employers.

Faculty performed well and were rated highly. Graduates are achieving professional success, moving into positions of responsibility and assuming professional leadership roles. Our Diabetes Exercise Center [DEC], Cardiac Rehabilitation Program [CRP], and Chronic Pain Management Program [CPMP] are also improving the lives of Tri-State residents and impacting other clients/patients and programs as they are replicated across the country by our graduates. In the words of one of our diabetes patients, “The program has restored meaning and purpose to my life.”

##### **Curriculum**

Our report provides strong documentation with both hard data and anecdotal responses for the rigor and effectiveness of the GESP. Graduates as well as employers gave high marks to our curriculum. Nine-two percent [92%] of our graduates rated themselves Significantly Well Prepared [58% to Well Prepared [34%] for employment. In the words of one of our graduates, “ I have fond memories of my academic career and recommend the program to others. I believe our students are well-prepared and superior to similar programs. Thank you.” See **Table 6D** for other comments. Our students are our best program recruiters. Their personal example as role models and their belief in our preparation for the profession sustain the program. Accordingly, the program has grown 100% and 26% over the last two 5-year reporting periods and 152% in the 15 years since its inception [**Appendices VI, VI-A Table, VI-A Figure**].

Students have confidence in our program and have expressed their approval of the curriculum. The program and curriculum are always works in progress because of the inherent changes in practice and in clinical guidelines. Every effort is made to adapt and adjust as these changes unfold. The literature, current opinion, and the feedback and opinions of our students, their employers,

and internship supervisors guide this process.

Employers rated the professional quality of all graduates in their employ [100%] as Superior [41%] to Above Average [59%] and 15 of 17 [88%] rated them as Significantly Prepared [35%] to Extremely Prepared [53%] for Employment. In the words of one employer, "The graduates I have employed...have made a positive contribution to our business from day one. These students...raise the bar. Please continue to move forward with your program, for the benefit of the students and the fitness industry." See **Table 6B** for other comments.

Ninety-eight percent [98%] of more than 50 interns were graded Superior to Definitely Above Average and Internship Supervisors affirmed they would hire all but 1 of the interns, should a position be available. In fact, a majority of our interns were hired at their internship site, including CAMC [8] and the Cleveland Clinic [2]. Some chose not to accept employment at the internship site because they had other employment options or they went on to pursue other degrees [e.g., MBA, Ph.D., Pharm.D.].

Completed theses have been presented at professional meetings, including the **American College of Sports Medicine National Conference** and published [e.g., *Medicine and Science in Sports*]. We have been verbally informed recently that one graduate who completed a thesis is currently working on his Ph.D. at the University of Florida.

## Faculty

There is demonstrable evidence of faculty achievement and scholarly activity [**Table 1, Table 10, and Faculty Data Sheets**]. This faculty of five [5] holds 4 terminal degrees, has published 33 articles, made 71 professional presentations, and attended 87 professional development activities over the past 5 years. Faculty has accrued \$625,800 in grants and contracts the past 5 years to support the GESP and related research.

Dr. Marley has been recognized nationally and internationally for his work in health promotion, disease prevention, cardiac rehabilitation, and cardiovascular medicine. He has published and lectured extensively and introduced new clinical management procedures and concepts into clinical practice. He has played an important role in the development of position papers and clinical practice guideline publications as well as chairing national symposia in cardiac rehabilitation and preventive medicine. He has been recognized as a *Fellow* of the American College of Sports Medicine [FACSM], as a *Fellow* of the American Association of Cardiovascular & Pulmonary Rehabilitation [FAACVPR], as an *American Fitness Leader* by the President's Council on Physical Fitness & Sports, received a *Career Achievement Award* from the American Heart Association, and is listed in *Who's Who in Diabetes Education and Research* by

the American Diabetes Association. As Director of the GESP, Dr. Marley has accumulated almost \$1,000,000 in grants and contracts during his 10 years at Marshall University.

Dr. Chandler is currently Chair for the Division of Exercise Science, Sport and Recreation [ESSR]. He is Editor-In-Chief of the *Strength and Conditioning Journal* and a nationally recognized expert in the field, having been certified as Strength and Conditioning Specialist with Distinction [CSCS\*D]. He has also been accorded Fellow status by the American College of Sports Medicine [FACSM]. As examination of his Faculty Data Sheet in Appendix II shows, he has an extensive record of research, publication, and professional presentations.

Dr. Martin is a Certified Athletic Trainer and Director of the Athletic Training Education Program at Marshall University. His program has been certified by the prestigious National Athletic Trainers' Association. His responsibilities include supervision of an extensive network of clinical internship sites where his students are assigned for their clinical experiences. Dr. Martin is an experienced sports medicine clinician who lectures extensively and was recognized in *Who's Who Among American Teachers* in 1998, 2000, and 2002.

Dr. Shepherd's work with metabolic systems analysis has had a national impact and revolutionized performance assessment and enhancement training. His scientific expertise is especially evident in a major project he is presently undertaking, **High Intensity Training [HIT] Centers, Incorporated**. Dr. Shepherd is President and CEO of this cutting-edge performance enhancement corporation and he has established HIT Centers in Huntington [WV], Lexington [KY], Jacksonville [FL], Spokane [WA], Brandon [FL], and Denver [CO]. HIT Centers are presently being developed in Clearwater [FL], San Diego [CA], Sewickley [Pittsburgh/PA], Morgantown [WV], Greensboro [NC], and Charlotte [NC]. A HIT Center Corporate Center for Development and Staff Certification is currently being built in Columbus [OH].

## **Graduates**

The GESP has been very successful in career placement of our graduates, in the Tri-State region as well as across the country [Table 9]. Our survey of more than 50 graduates showed that 94% of them are employed **In Field** [66%] or in an **Allied Field** [28%]. Even those who have, in a sense, changed careers—they are really allied careers, have been successful: a doctorate in pharmacy, cardiology programmed electrophysiology specialist, physician recruiter for a health care system, and an elementary physical education teacher.

Graduates have not only been very successful in finding employment in their field, but they are starting at good salaries with fine benefit packages and receiving good increments as their careers progress. They are also assuming leadership roles in their positions [Table 8] and in professional societies: two [2] of them have served as state presidents for Cardiovascular & Pulmonary Rehabilitation Societies. Others have and are serving in related capacities for

similar societies across the country.

### **Assessment**

More than 50 graduates and almost 20 employers responded to our questionnaire surveys. Assessment is an ongoing process because of the strength of our graduate, internship site and employer networks. These networks utilize hard copy correspondence, email and the telephone for communication and transmission of information. This information is vital to our program and includes professional employment opportunities, assistance with highly qualified guest speakers, educational materials [especially from our pharmaceutical grads], and advice on curricular content.

### **Accreditation**

There is no standardized licensure procedure or program accreditation for Exercise Science Program graduates. Those completing an internship are, however, required to take a comprehensive oral examination in the presence of a select faculty committee and those writing a thesis must defend their completed research in similar fashion.

Although there are no existing national standards for Exercise Science graduates, many have completed the requirements for certification as *Exercise Specialist* by the American College of Sports Medicine, competing very favorably with students from other programs across the country. All of our students are required to be certified as *CPR Healthcare Providers with Automatic External Defibrillator* [AED] certification by the **American Heart Association [AHA]**. All of our students are required to take PE 687 *Advanced Cardiac Life Support [ACLS]*, a preparatory class as part of their curriculum. Recently, all of our students in the *Clinical Applied Area of Emphasis* have also successfully completed **AHA ACLS** class at the Medical Center and received certification prior to their internship, an important professional achievement and qualification in the clinical setting. Many other graduates have completed this latter certification during internships and on-the-job.

# APPENDIX

|                      |   |
|----------------------|---|
| <b>Chart I</b>       | <b>Assessment Summary</b>   |
| <b>Appendix I</b>    | <b>Exercise Science Course Requirements</b>   |
| <b>Appendix II</b>   | <b>Faculty Data Sheets</b>  |
| <b>Appendix III</b>  | <b>Not applicable</b>   |
| <b>Appendix IV</b>   | <b>Not Applicable</b>   |
| <b>Appendix V</b>    | <b>Program Course Enrollment</b>  |
| <b>Appendix VI</b>   | <b>Enrollment</b>   |
| <b>Appendix VI-A</b> | <b>Table. 15-Year Enrollment Summary</b>  |
| <b>Appendix VI-A</b> | <b>Figure. 15-Year Enrollment Summary:<br/>Exercise Science Graduates<br/>By Five-Year Reporting Cycles</b> |

**Chart I Assessment Summary**  
**Marshall University**  
**Assessment of Student Outcomes: Component/Course/Program Level [5 year summary]**  
**Component Area/Program/Discipline: Exercise Science**

| <b>Component / Course / Program Level</b> |  |   |  |  |   |
|---|--|---|--|--|---|
| <b>Student Outcome</b>                    | <b>Person or Office Responsible</b>                                  | <b>Assessment Tool or Approach</b>  | <b>Standards/Benchmark</b>   | <b>Results/Analysis</b>  | <b>Action Taken</b>   |
| 1. Admission Competencies                 | Program Director   | UG – GPA<br>Science background<br>Consider GRE scores;<br>interview; letters of rec.                      | 3.00 GPA Full Admission<br>UG Exercise Physiology<br>UG Fitness Assessment<br>UG Kinesiology             | Annual and 5-year program growth and percent of graduates working <u>In Field</u> or <u>Allied Field</u> . | Establish more rigid entrance criteria and increase rigor of Exercise Science curriculum              |
| 2. Statistical Analysis                   | Program Director, course instructors, oral exam committee            | PE 670; EDF 517, 621, 625; PSY 623, 624; MGT 500, MKT 683   | Successful completion of course work.<br>Pass oral examination.  | Course application; student performance on oral examinations.  | Show students relevance in daily practice and patient outcome data management                         |
| 3. Research Design                        | Program Director, course instructors, oral exam committee            | PE 670; EDF 517, 621, 625; PSY 623, 624; MGT 500, MKT 683   | Successful completion of course work.<br>Pass oral examination.  | Number of student passing courses. Student performance on orals.   | Program management:: minimize variance and maintain quality control                                   |
| 4. Related Literature                     | Program Director; advisors, course instructors, oral exam committee. | PE 621, 670, 682, 683, 684, 685; student literature reviews; comprehensive oral examination.              | Successful completion of course work, internship, thesis, and comprehensive oral examination.            | Number of student passing courses. Student performance on oral examinations                                | Implement current medical opinion: ATP III, JNC VII; ADA Clinical Practice Guidelines & benchmarking  |
| 5. Clinical Skills                        | Program Director; advisors, course instructors, oral exam committee. | PE 601, 621, 683, 684, 687, COUN 577, 535, 540, internship, thesis; oral examination                      | Successful completion of course work, internship [site], or thesis. Pass comprehensive oral examination. | Performance in classes, internship & related tasks, quality of thesis, and oral examination.               | Medical Profile Test Development & Case Management training; Cases assigned.                          |
| 6. Best Practices                         | Program Director advisors, course instructors, oral exam committee.  | All course work, internship, thesis, and oral exam; EKG and ACLS Courses at the Medical Center.           | Successful completion of course work, internship [site], thesis, & pass comprehensive oral examination.  | Performance criteria standards achieved in classes, internship, thesis, & oral examination.                | Application of screening, stratification, risk stratification in DEC, CRP, CPMP, internship. thesis . |
| 7. Technical Skills                       | Program Director; advisors, course instructors, oral exam committee. | PE 601, 621, 683, 684, 687 internship, oral exam; EKG/ ACLS Courses Medical Ctr. Verification procedures. | Successful completion of course work and internship. Pass oral examination. Verification record.         | Performance in classes, internships, and oral examinations. Clinical skill achieved.                       | EKG, BP, blood glucose, MSET, ACLS, patient management skills: clinical assignment.                   |
| 8. Graduate satisfaction                  | Program Director   | Survey questionnaire; personal interview; network   | Graduate satisfaction ratings from questionnaires/interviews.  | Questionnaire and interview data   | Revise program content, website, & guest speakers   |
| 9. Employer satisfaction                  | Program Director   | Survey questionnaire; personal interview; network   | Employer satisfaction ratings from questionnaire/interviews.   | Questionnaire data and interview data  | Revise program content;, website, & guest speakers.   |

# APPENDIX I

## EXERCISE SCIENCE: COURSE REQUIREMENTS

Clinical Applied Area of Emphasis:

|   | Hours |
|---|-------|
| Minimum requirements.....   | 39    |
| Exercise Science Courses – 21 Hours Required:                                 |       |
| PE 621 – Scientific Aspects of Physical Education .....                       | 3     |
| PE 670 – Research in Physical Education .....                                 | 3     |
| PE 682 – Preventive and Rehabilitative Physiology.....                        | 3     |
| PE 683 – Cardiovascular Assessment .....                                      | 3     |
| PE 684 – Developing Exercise, Nutritional, and Behavioral Prescriptions ..... | 3     |
| PE 685 – Development & Adm. of Preventive & Rehab. Medical Programs .....     | 3     |
| PE 687 – Cardiac Life Support.....  | 3     |
| Restricted Electives – 9 Hours Required:                                      |       |
| FCS 508 – Nutrition in Cardiac Disease.....                                   | 3     |
| Coun 535 – Group Process/Analysis .....                                       | 3     |
| Coun 604 – Group Counseling & Theories .....                                  | 3     |
| Coun 577 – Stress Management Counseling.....                                  | 3     |
| PE 578 – Special Topics: Health & Wellness Counseling.....                    | 3     |
| PE 586 – Independent Study.....   | 1-4   |
| PE 601 – Advanced Exercise Testing .....                                      | 3     |
| Research Courses – 3 Hours Required:  |       |
| EDF 517 – Statistical Methods .....   | 3     |
| EDF 621 – Educational Research and Writing.....                               | 3     |
| EDF 625 – Qualitative Research in Education .....                             | 3     |
| PSY 623 – Experimental Design .....   | 3     |
| PSY 624 – Multivariate Analysis.....  | 3     |
| MGT 500 – Analytical Methods and Techniques.....                              | 3     |
| MKT 683 – Advanced Marketing Research.....                                    | 3     |
| <b><i>Other courses may be taken with permission.</i></b>                     |       |
| PE 660 – Clinical Internship .....  | 6     |

## APPENDIX I [Continued]

| Exercise Physiology Area of Emphasis:  | Hours |
|--|-------|
| Minimum Requirements .....   | 39    |
| Exercise Science Courses – 27 Hours Required.....                                  | 3     |
| PE 578 – Energy Sources, Body Composition and Performance.....                     | 3     |
| PE 585 – Independent Study.....  | 3     |
| PE 586 – Independent Study.....  | 3     |
| PE 587 – Independent Study.....  | 3     |
| PE 588 – Independent Study.....  | 3     |
| PE 601 – Advanced Exercise Testing .....   | 3     |
| PE 621 – Scientific Aspects of Physical Education .....                            | 3     |
| PE 651 – Mechanical Analysis of Motor Skills .....                                 | 3     |
| PE 670 – Research in Physical Education .....                                      | 3     |
| PE 683 – Cardiovascular Assessment .....   | 3     |
| PE 684 – Dev. Exercise, Nutritional, & Behavioral Prescriptions.....               | 3     |
| Research Courses – 3 Hours Required  |       |
| EDF 517 – Statistical Methods .....  | 3     |
| EDF 621 – Educational Research and Writing.....                                    | 3     |
| EDF 625 – Qualitative Research in Education .....                                  | 3     |
| PSY 623 – Experimental Design .....  | 3     |
| PSY 624 – Multivariate Analysis.....   | 3     |
| Restricted Electives – 3 Hours Required .....                                      | 3     |
| <b><i>Other courses may be taken with permission.</i></b>                          |       |
| Option:  |       |
| PE 660 – Internship.....   | 6     |
| PE 681 – Thesis.....   | 6     |
| Research Courses – 3 Hours Required  |       |
| Professional societies that have influenced the program offering and requirements: |       |
| American College of Sports Medicine  |       |
| American Association for Cardiovascular & Pulmonary Rehabilitation                 |       |
| American Medical Association   |       |
| • The Journal of the American Medical Association                                  |       |
| Massachusetts Medical Society  |       |
| • The New England Journal of Medicine  |       |
| National Strength and Conditioning Association                                     |       |

## **Appendix III**

**Appendix III is not applicable.**

## **Appendix IV**

**Appendix IV is not applicable.**

## Appendix V Program Course Enrollment

| Course Number | COURSE NAME                                 | REQUIRED/<br>ELECTIVE | YEAR 1<br>1998-1999 |    |    | YEAR 2<br>1999-2000 |    |    | YEAR 3<br>2000-2001 |    |    | YEAR 4<br>2001-2002 |    |    | YEAR 5<br>2002-2003 |    |    |
|---------------|---|-----------------------|---------------------|----|----|---------------------|----|----|---------------------|----|----|---------------------|----|----|---------------------|----|----|
|               |   |                       | SU                  | FA | SP | SU                  | FA | SP | SU                  | FA | SP | SU                  | FA | SP | SU                  | FA | SP |
| PE 578        | Energy Sources, Body Comp. & Performance    | *                     |                     | 10 |    |                     | 14 |    |                     | 14 |    |                     | 11 |    |                     |    |    |
| PE 585        | Independent Study                           | *                     | 3                   |    |    |                     | 3  |    |                     | 4  |    |                     |    |    |                     |    |    |
| PE 586        | Independent Study                           | *                     |                     | 1  |    |                     | 2  | 3  |                     |    |    |                     |    |    |                     |    |    |
| PE 587        | Independent Study                           | *                     |                     |    | 5  | 2                   | 3  | 7  | 1                   |    | 3  |                     |    | 2  |                     | 3  |    |
| PE 588        | Independent Study                           | *                     |                     |    | 2  |                     |    |    |                     |    | 2  |                     |    | 2  |                     | 2  |    |
| PE 601        | Advanced Exercise Testing                   | *                     |                     |    |    |                     |    | 19 |                     |    | 19 |                     |    | 19 |                     | 18 |    |
| PE 621        | Scientific Aspects of PE                    | *                     |                     |    | 25 |                     | 34 |    | 10                  | 25 |    |                     | 32 |    | 6                   | 30 |    |
| PE 636        | Structural Kinesiology                      |                       |                     |    |    |                     |    | 22 |                     |    |    |                     |    |    |                     |    |    |
| PE 660        | Internship                                  | *                     |                     | 3  | 7  | 7                   | 0  | 7  |                     | 1  | 5  | 4                   | 2  | 8  | 2                   | 3  | 5  |
| PE 670        | Research in Physical Education              | *                     |                     | 37 | 13 |                     | 32 |    |                     | 28 |    |                     | 39 |    | 8                   |    | 31 |
| PE 681        | Thesis                                      | *                     |                     | 1  | 2  |                     | 5  | 6  | 1                   | 6  | 4  |                     | 1  | 2  |                     | 5  |    |
| PE 682        | Health Promotion, Disease Prev. & Rehab.    | *                     |                     |    | 10 |                     |    | 8  |                     |    | 5  |                     |    |    |                     |    | 13 |
| PE 683        | Cardiovascular Assessment                   | *                     |                     | 16 |    |                     | 14 |    |                     | 15 |    |                     | 15 |    |                     | 16 |    |
| PE 684        | Developing Exercise, Nut. & Behavioral Rx   | *                     |                     |    | 14 |                     |    | 8  |                     |    | 10 |                     |    |    | 3                   |    | 20 |
| PE 685        | Develop. /Adm. Prev. & Rehab. Med. Programs | *                     |                     | 13 |    |                     | 11 |    |                     | 7  |    |                     | 6  |    |                     | 6  |    |
| PE 687        | Cardiac Life Support                        | *                     | 5                   | 24 |    | 2                   | 15 |    | 3                   | 11 |    |                     | 13 |    |                     | 23 |    |
| PE 642        | Training and Conditioning Programs          | 1                     |                     |    | 17 |                     | 19 |    |                     |    | 22 |                     |    | 10 |                     |    |    |
| PE 646        | Athletic Training I                         | 1                     |                     |    |    |                     |    |    |                     |    |    |                     |    |    |                     |    | 9  |
| HE 640        | Health Assessment II                        | 1                     |                     |    | 8  |                     |    | 7  |                     |    | 7  |                     |    | 10 |                     |    |    |

**1 These courses may be substituted for some required courses.**

**APPENDIX VI  
ENROLLMENT**

|                   | Fall<br>1998 | Fall<br>1999 | Fall<br>2000 | Fall<br>2001 | Fall<br>2002 |
|-------------------|--------------|--------------|--------------|--------------|--------------|
| <b>Admissions</b> | <b>34</b>    | <b>33</b>    | <b>24</b>    | <b>33</b>    | <b>28</b>    |
| <b>Graduates</b>  | <b>13</b>    | <b>15</b>    | <b>7</b>     | <b>13</b>    | <b>10</b>    |

**APPENDIX VI-A Table**

**15 – YEAR ENROLLMENT SUMMARY**

|                  | 1988-1992 | 1993-1997 | 1998-2002 | 3 - Year<br>Total |
|------------------|-----------|-----------|-----------|-------------------|
| <b>Graduates</b> | <b>23</b> | <b>46</b> | <b>58</b> | <b>127</b>        |

**APPENDIX VI-A Figure.  
15-YEAR SUMMARY OF EXERCISE SCIENCE GRADUATES  
BY FIVE – YEAR REPORTING CYCLES**

