5-5-2011

SR-10-11-37 APC

Marshall University

ACADEMIC PLANNING COMMITTEE RECOMMENDATION

SR-10-11-37 APC

Recommends that the Marshall University College of Health Professions' Intent to Plan for a BS in Biomechanics be approved.

RATIONALE:

The Academic Planning Committee reviewed the Biomechanics Intent to Plan and voted to approve.

FACULTY SENATE CHAIR:

APPROVED BY THE FACULTY SENATE: Ron Blanner DATE: 5/5/14

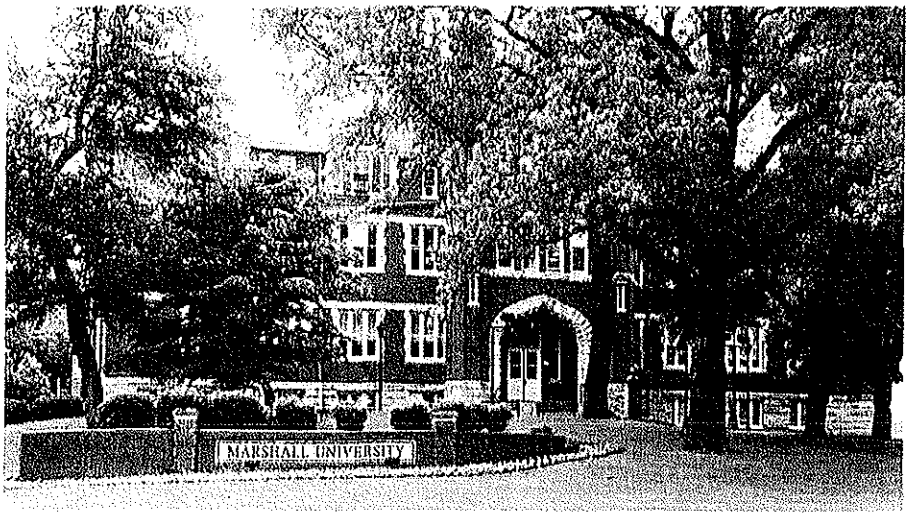
DISAPPROVED BY THE FACULTY SENATE: _____ DATE: _____

UNIVERSITY PRESIDENT:

APPROVED: _____ DATE: 3/17/12

DISAPPROVED: _____ DATE: _____

COMMENTS: _____



Marshall University

December 1, 2010

Intent to Plan to Establish

Bachelor of Science in Biomechanics

Huntington Campus

Prepared By:

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Chair & Associate Professor
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PART 1: PROGRAM DESCRIPTION

The College of Health Professions (COHP) is proposing to offer a BS in Biomechanics. The Mission of the Biomechanics Education Program at Marshall University would be to meet the academic needs of individuals desiring to enter the biomechanics profession, to become research assistants, continue in a professional graduate school such as athletic training, physical therapy, medical school, health informatics, safety, engineering, biomedical engineering, etc. This mission is accomplished through curricula planning and faculty organization. The Biomechanics Education Program provides education and services for a society that is open, complex, scientifically oriented, demanding and evolving.

A. Program Objectives

The Bachelor of Science in Biomechanics will provide the opportunity to:

1. Acquire skills and knowledge required for advanced practice
2. Develop specialized skills for advanced analysis & testing, program recommendations, management, clinical education, and assessment
3. Become engaged in life-long learning and to prepare for post-baccalaureate studies
4. Meet the societal needs for advanced level biomechanist who are able to practice in diverse healthcare and industrial environments
5. Utilize critical thinking skills in biomechanics practice
6. Apply communication skills to biomechanics practice

B. Program Identification

The following is the appropriate program identification as provided in the Classifications of Instructional Programs developed and published by the U.S. Department of Education Center for Educational Statistics.

CIP Code 51.2314

Title: Rehabilitation Science.

Definition: A program that focuses on human function, disability, and rehabilitation from the perspectives of the health sciences, social sciences, psychology, engineering, and related fields. Includes instruction in psychological, social, and cultural aspects of disability and rehabilitation; sensory and motor function and dysfunction; **biomechanics** and kinesiology; assistive technology; rehabilitation instrumentation and methodology; statistics; and health and rehabilitation policy.

C. Program Features

The Bachelor of Science in Biomechanics program would be the first program in the state of West Virginia.

Students pursuing a baccalaureate degree in Biomechanics will complete a common core of classes to include a biomechanics professional core and the Marshall Core requirements for general education.

1. Admission and Performance Standards

Prospective students who wish to apply for admission to the Bachelor of Science in Biomechanics degree program must meet the admission requirements listed below. In addition to admission to Marshall University the students must meet the following:

Admission/Retention Criteria

- Declared Biomechanics as a major
- A "C" or better in all required courses in the major
- A "B" or better in senior biomechanics coursework (300-400 level courses)
- An overall cumulative minimum GPA of 2.70 to matriculate in the degree program beyond the Sophomore year

Regardless of the major, all students will complete the Marshall Core Plan and a core group of subjects in the major area. These courses are listed below and constitute 105 credit hours.

PROFESSIONAL CORE

BSC 227	Human Anatomy
BSC 228	Human Physiology
MTH 225	Statistics
ESS 201	Intro to Applied Anatomy and Physiology
ESS 345	Exercise Physiology
ESS 346	Exercise Physiology Lab
ESS 369	Motor Learning
ESS 375	Fitness Assessment and Exercise Prescription
ESS 401	Ethics in Sport or other 300-400 Ethics Course
ESS 410	Administration and Organization
ESS 435	Adapted Physical Education
ESS 442	Principles of Strength and Conditioning
ESS 443	Principles of Strength and Conditioning Laboratory
DTS 314	Nutrition & Diet Therapy
HS 200	Medical Terminology for the Athletic Trainer
HS 215	Intro to Athletic Training
HS 220	Personal Health I
HS 222	First Aid
HS 365	Functional Biomechanics
HS 464	Pathomechanics
HS 465	Biomechanical Analysis of Movement
HS 475	Trends in Biomechanical Analysis **(Capstone)**
SFT 235	Intro to Safety
SFT 373	Principles in Ergonomics & Human Factors
SFT 373L	Principles in Ergonomics Lab
PHY 201	Physics 1
PHY 202	Physics 1 Lab
PHY 203	Physics
PHY 204	Physics 2 Lab
PSY 201	General Psychology
PSY 311	Child Development
PSY 312	Adult Development

HS 490 Internship

Credit hours for clinical practicum's are based on 1 credit hour per 65 hours of clock time.

The following areas of Concentration will be available to students to major in:

(1) Students completing the Biomechanics Comprehensive major will complete a block of restricted electives to give him/her 120 hours toward graduation.

(2) Students completing the Biomechanics Pre-Physical Therapy major will complete the following in addition to the core courses. Summer school will be required to complete this degree in 4 years.

- CHM 211 Principles of Chemistry I 3 credit hours
- CHM 217 Principles of Chemistry I Lab 2 credit hours
- CHM 212 Principles of Chemistry II 3 credit hours
- CHM 218 Principles of Chemistry II Lab 2 credit hours
- BSC 120 Principles of Biology 4 credit hours
- BSC 121 Principles of Biology 4 credit hours

The Biomechanics Pre-Physical Therapy major has no electives available for students.

(3) Students completing the Biomechanics Pre-Medical major will complete the following in addition to the core courses. Summer school will be required to complete this degree in 4 years.

- CHM 211 Principles of Chemistry I 3 credit hours
- CHM 217 Principles of Chemistry I Lab 2 credit hours
- CHM 212 Principles of Chemistry II 3 credit hours
- CHM 218 Principles of Chemistry II Lab 2 credit hours
- CHM 355 Organic Chemistry I 3 credit hours
- CHM 356 Organic Chemistry II 3 credit hours
- CHM 361 Intro Organic Chemistry Lab 3 credit hours
- BSC 120 Principles of Biology 4 credit hours
- BSC 121 Principles of Biology 4 credit hours

The Biomechanics Pre-Medical major has no electives available for students.

(4) Students completing the Biomechanics Physics major will complete the following in addition to the core courses.

- PHY 350 Biomedical Physics 4 credit hours
- PHY 304 Optics 3 credit hours
- PHY 405 Optics Laboratory 2 credit hours
- PHY 314 Electronics 3 credit hours
- PHY 315 Electronics Laboratory 2 credit hours

The Biomechanics Physics major has no electives available for students.

(5) Student completing the Biomechanics Safety major will complete the following in addition to the core courses.

- SFT 372 Safety & Industrial Technology 3 credit hours
- SFT 375 Construction Safety 3 credit hours
- SFT 378 Safety Evaluation & Measurement 3 credit hours
- SFT 460 Safety Training Methods 3 credit hours
- SFT 458 Hospital Safety 3 credit hours

The Biomechanics Safety major has no electives available for students.

D. **Program Outcomes**

The following outcome measures have been established for the Bachelor of Science in Biomechanics:

1. Eighty-five percent or more of all students admitted will successfully complete the program within four years.
2. The graduates will rank satisfaction with the program at 4.0 or greater on a scale of 1 to 5.
3. Graduates will have a 100% placement into professional graduate schools.
   OR
   Graduates will have a 90% employment placement within 1 year

E. **Program Delivery**

All didactic coursework will be offered on the Huntington campus with some having online options, but will be offered in the classroom during student's matriculation period.

PART II: PROGRAM NEED AND JUSTIFICATION

A. Relationship to Intuitional Goals/Objectives

The Biomechanics Education Program will reflect the institutions goals and objectives. Marshall University's mission states that "Marshall University is a multi-campus public university providing innovative undergraduate and graduate education that contributes to the development of society and the individual." The Biomechanics Education Program will mimic this statement in that the majors within this degree program will be innovative, reflect current trends, and will move Marshall University toward programs of the future that other institutions do not offer. By offering dual track majors, this degree will prepare students to be better trained clinicians serving our society.

B. Existing Programs

Marshall's Biomechanics Education Program will be the first program of its kind in the state of West Virginia.

C. Program Planning and Development

With the recent hire of a biomechanist in the School of Kinesiology (SOK) faculty are in place to teach the core coursework required for this degree program. Excellent support at the college level (College of Health Professions) has been given by the dean as well as other administration. Resources, personnel, equipment, and funding currently exist within the SOK budget lines.

D. Clientele and Need

The majority of students potentially attending Marshall University for biomechanics will be from WV and the tri-state area. By offering areas of emphasis in biomechanics pre-physical therapy, biomechanics pre-med, and biomechanics safety, Marshall will draw students from across the nation moving Marshall toward being a destination university. The need for this type of degree program is needed in many areas. With evolving global technologies the need for having students adept with biomechanical concepts and analysis techniques is critical to prepare a competent work force for areas such as prosthetics, activity analysis, gait mechanics and deficiencies, industrial, ergonomics, research data collection, military and other government agencies. The MU Physicians and Surgeons, Department of Orthopaedics have requested speaking engagements on biomechanics due to the lack of background of current medical students and resident physicians in the use of biomechanics as it pertains to patient care. The Biomechanics degree program would offer a route preparation that other degree programs currently do not offer. This is also true for other graduate allied health professions with regard to the undergraduate preparation. The U.S. Bureau of Labor Statistics in its 2010-2011 edition of job growth outlook indicates that jobs within the Biomechanical field will have an 11% growth through 2018. In addition of job growth it is indicated that starting salaries is among the highest of all college graduates. There is not currently a degree program in Biomechanics in the state of West Virginia forcing students to leave the state to acquire an education in this area.

E. Employment Opportunities

Employment opportunities in the field of biomechanics are research and development, university researcher/research technician, hospital researcher/research technician, military researcher/research technician, cooperate research, industrial research and injury prevention, ergonomics, graduate school teaching/research assistants.

Salaries range from $30,000.00-$50,000.00/year in hospital and corporate job settings up to $90,000.00-$100,00.00+/year in government and industrial job settings.

F. Program Impact

The proposed program will support current programming at Marshall University (e.g. Engineering, Health sciences, Safety, Biomedical Science, Physical Sciences, etc.). By the addition of this degree program it offer advanced coursework that could be utilized by other degree programs. It will also offer collaborative degree offerings and research opportunities. It will train highly qualified candidates to continue in post undergraduate programs currently offered at Marshall University. This would greatly enhance grant funding and research opportunities due to the fact that a broader collaboration between peer educators and practitioners would be facilitated by the ability to apply for a broader spectrum of grants and funding resources. By developing this degree program and faculty research lines that are endemic to this field it will attract students to Marshall as a destination university and will move Marshall into the next generation of uniquely skilled graduates.

G. Cooperative Arrangements

There is strong precedence for this type of program. There is currently cooperative arrangements with Cabell Huntington Hospital, Huntington Physical Therapy, Cabell EMS, Bellefonte Hospital, St. Mary's Hospital, Trinidad Orthopedics, Tri-State Physical

Therapy, Elite Rehab and Fitness, Nichols Chiropractic, Profitt Chiropractic, Cabell County Schools, Chesapeake Exempted Union Village Schools, Fairland Independent Schools, Boyd County Schools, Wayne County Schools, Greenup County Schools, Kentucky Christian University, Arena Football, Marshall Athletics, and Hanger Prosthetics and Orthotics for clinical experiences for students in the Athletic Training Education program which will be available for student in the Biomechanics Education Program.

There is also support from the College of Computer Information & the College of Health Professions at Marshall University.

H. Alternatives to Program Development

Currently there are no program alternatives. Students wishing to pursue this degree would have to transfer out of state.

PART III: PROGRAM IMPLEMENTATION AND PROJECTED RESOURCE REQUIREMENTS

A. Program Administration

Program administration will be accomplished by a Program Director who is highly qualified and with national affiliations with USA Track and Field High Performance Center, NFL, and other biomechanical related agencies. The Program Director will organize, administer, review, develop and assure program effectiveness though on-going program assessment. This person will participate in the budget process and be responsible for a leadership role in the continued development of the program. It is expected that the Program Director will maintain current knowledge of the professional discipline and educational methodologies. This faculty position is currently funded and filled by a qualified individual.

B. Program Projections

The demand is such in the tri-state area that projected program enrollment for year one will be 10-15 students. As the program becomes established, enrollment projections suggest classes of 15-25 per year.

C. Faculty Instructional Requirements

Thirteen full time faculty exist in the School of Kinesiology. Four of these full time faculty lines are currently in Athletic Training/Health Science with one being a biomechanist to support the core coursework in the proposed program, four that support studies in Sport Management, two that support studies in Physical Education, and three that support studies in Exercise Science. This position was developed and recruited to teach the Biomechanics program coursework. No additional faculty is needed to offer the degree program in Biomechanics. All coursework will be taught in the regular teaching load of current faculty.

D. Library Resources and Instructional Materials

Existing Library sources are adequate to meet the needs of students pursuing a BS in Biomechanics degree. As MU students, biomechanics students can access all Marshall

University electronic databases and other library resources including the Medical School library.

E. Support Service Requirements

All support services are currently available to MU students.

F. Facilities Requirements

Facility requirements are currently available for the biomechanics program.

G. Operating Resource Requirements

With the recent hire of a biomechanist (Dr. Konz) no additional resources are needed; the program is currently funded through The College of Health Professions School of Kinesiology. The program can be operated within existing structure the School of Kinesiology in the COHP. Core coursework will be taught by Dr. Konz and supportive required coursework will be taught in existing sections of current course offerings in Athletic Training, Exercise Science, Physical Education, Physics, Engineering, Safety, and other existing programs at Marshall University (see supportive email correspondence). The FIVE-YEAR PROJECTION OF TOTAL OPERATING RESOURCES REQUIREMENTS (133CSR11) table on page 13 of this document reflects all faculty which support all majors and programs as well as single budget line for the School of Kinesiology.

H. Source of Operating Resources

Faculty, personnel and facility resources are currently in place supporting the existing program within the School of Kinesiology in the COHP.

PART IV: OFFERING EXISTING PROGRAMS AT NEW LOCATIONS

Not Applicable

PART V: PROGRAM EVALUATION

A. Evaluation Procedures

Internal Evaluation:

Evaluation is a critical component to effective programs. Marshall University has a systematic and on-going evaluation process. All departments submit an annual evaluation and program evaluation through the Office of Program Review and Assessment.

Faculty that are employed at Marshall University must conduct annual employee evaluations. All courses developed are submitted through the appropriate committees for approval by Marshall University.

Throughout the B. S. in Biomechanics, a variety of measures are employed to assess student learning and comprehension. Among the measures utilized in the classroom setting include, but are not limited to, written objectives and examinations. During the internship setting, student competence will be evaluated by the supervising faculty and the internship supervisor.

Another common practice of measuring competence is through student GPA. The B.S. in Biomechanics Education Program policies state that a student must maintain a GPA of 2.70 throughout the program. If the student's GPA falls below a 2.70, they will be placed on academic probation and have one semester to bring it to an acceptable level or be suspended from the program for one academic year. A "B" or better is required in all upper division coursework.

External Evaluation

The Graduate Survey, which has been discussed above, is another method utilized to measured preparedness for advanced practice. After working in the field for six and twelve months, graduates will be asked to complete a survey that solicits their feedback on the program's effectiveness in preparing them for practice.

Graduates of the program will be asked to submit the name of their employer upon securing professional employment. For the alumni who supply this information, an online survey will be sent to their employer to solicit information on their ability to perform in their current capacity. This provides additional feedback to enhance program content.

B. Accreditation Status

Currently there is not an accrediting body for Biomechanics.

Part VI: Termination of Program

In the unforeseeable event that the program would be terminated, currently enrolled students would have the opportunity to matriculate through the coursework and/or change their major to another related major.

133CSR11

FORM 1
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FIVE-YEAR PROJECTION OF PROGRAM SIZE

	First Year (2011)	Second Year (2012)	Third Year (2013)	Fourth Year (2014)	Fifth Year (2015)
Number of Students Served through Course Offerings of the Program:					
Headcount	1,115	1,115	1,195	1,195	1,195
FTE	3,568	3,568	4,780	4,780	4,780
Number of student credit hours generated by courses within the program (entire academic year):	53,520	53,520	71,700	71,700	71,700
Number of Majors:					
Headcount	15	25	35	45	55
FTE majors	37.5	50	70	90	110
Number of student credit hours generated by majors in the program (entire academic year):	450	750	1,050	1,350	1,650
Number of degrees to be granted (annual total):	0	5	10	15	20

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FORM 2
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FIVE-YEAR PROJECTION OF
TOTAL OPERATING RESOURCES REQUIREMENTS*

	First Year FY(2008)	Second Year FY(2009)	Third Year FY(2010)	Fourth Year FY(2011)	Fifth Year Y(2012)
A. FTE POSITIONS					
1. Administrators	2	2	2	2	2
2. Full-time Faculty	13	13	13	13	13
3. Adjunct Faculty	7	7	7	7	7
4. Graduate Assistants	8	8	8	8	8
5. Other Personnel:					
a. Clerical Workers	2	2	2	2	2
b. Professionals	n/a	n/a	n/a	n/a	n/a

Note: Include percentage of time of current personnel

B. **OPERATING COSTS** (Appropriated Funds Only)

1. Personal Services:					
a. Administrators *	104,000.00	104,000.00	104,000.00	104,000.00	104,000.00
b. Full-time Faculty	656,000.00	656,000.00	656,000.00	656,000.00	656,000.00
c. Adjunct Faculty	11,600.00	11,600.00	11,600.00	11,600.00	11,600.00
d. Graduate Assistants	27,840.00	27,840.00	27,840.00	27,840.00	27,840.00
e. Non-Academic Personnel:					
Clerical Workers	41,000.00	41,000.00	41,000.00	41,000.00	41,000.00
Professionals	31,000.00	31,000.00	31,000.00	31,000.00	31,000.00
Total Salaries *	767,440.00	767,440.00	767,440.00	767,440.00	767,440.00

*** Administrators are generated from faculty lines, therefore not included in total salaries to keep from duplicating salaries and skewing the total.**

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FORM 2
Page 2 of 2

FIVE-YEAR PROJECTION OF
TOTAL OPERATING RESOURCES REQUIREMENTS*

	First Year (2008)	Second Year (2009)	Third Year (2010)	Fourth Year (2011)	Fifth Year (2011)
2. Current Expenses	23,749	23,749	23,749	23,538	23,749
3. Repairs & Alterations	8,000	8,000	8,000	8,000	8,000
4. Equipment:					
Educational Equip.	1,200	1,200	1,200	1,200	1,200
Library Books	0	0	0	0	0
5. Nonrecurring Expense (specify)	0	0	0	0	0
Total Costs	32,738	32,738	32,738	32,738	32,738

C. **SOURCES**

1. General Fund Appropriations (Appropriated Funds Only)	36,889	36,889	36,889	36,889	36,889
___X___ Reallocation _____ New funds (Check one)			**X Funds Currently Exist**		
2. Federal Government (Non-appropriated Funds Only)	0	0	0	0	0
3. Private and Other (specify)	48,000	48,000	48,000	48,000	48,000
Total All Sources	84,889	84, 889	84, 889	84, 889	84, 88

NOTE: Total costs should be equal to total sources of funding
*Explain your Method for Predicting the Numbers **(Use additional sheet if necessary)**

A current budget line exists through the COHP for the School of Kinesiology (SOK). This budget line currently supports Athletic Training, Exercise Science, Sport Management & Marketing, and Physical Education pedagogy. Our operating budget and faculty line budget are not projected or predicted, they currently support the SOK's existing programs.