A. Abstract

Ph.D. in Health and Rehabilitation Sciences
To be offered on campus by Indiana University, Indianapolis

Objectives. To develop scholars who, through their leadership and original research, will contribute to the knowledge base of health and rehabilitation sciences. As documented in numerous recent landmark reports, there is a critical need for our nation to develop such scholars. The School of Health and Rehabilitation (SHRS) must offer the Ph.D. to position it as a national leader in this emerging field and the School's students should have an opportunity to prepare themselves for careers as scholars to meet present and future employment opportunities. Research in health and rehabilitation sciences will also promote Indiana University's Life Sciences Strategic Plan.

The World Health Organization defines Health as, "not merely the absence of disease or infirmity but a state of complete physical, mental, and social well-being."[1]

The Institute of Medicine (IOM) defines Rehabilitation as "the process by which physical, sensory or mental capacities are restored or developed through both function change in the person and changes in the physical or social environments."

The IOM defines Rehabilitation Science as "a field of study that encompasses basic and applied aspects of the health sciences, social sciences, and engineering. It is the melding of knowledge from several disciplines to understand the fundamental nature of the enabling-disabling process."

Clientele to be Served. The program will serve primarily graduates of the post baccalaureate programs of the School of Health and Rehabilitation Sciences as well as similar or related programs.

Curriculum. The 90-92 credit hours for the Ph.D. are distributed as follows:

A. Health and Rehabilitation Sciences Core Curriculum (12 credits in required courses)
   Rehabilitation Theories and Applications (3 credits)
   Theories of Health Promotion and Disease Prevention (3 credits)
   Rehabilitation Services in Healthcare Systems and Delivery (3 credits)
   Teaching Practicum within area of specialization (3 credits)

B. Health and Rehabilitation Sciences Concentration (30 credits)
   Students will select one of the three areas of concentration identified by the Institute of Medicine. Areas of concentration include:
   - Pathophysiology and Impairment
   - Functional Limitations
   - Health Services

[1] Constitution of the World Health Organization. Chronicle of the World Health Organization. Geneva Switzerland: WHO, 1947

C. Research Core (42-44 credits)
   Statistics and Research Design courses (9 credits)
   Techniques of Effective Grant Writing (3 credits)
   Writing for Publication (3 credits)
   Research Ethics (1-3 credits)
   Research Practicum within concentration (6 credits)
   Doctoral Seminar in Health and Rehabilitation Sciences (1 credit)
   Dissertation to include proposal in Health and Rehabilitation Sciences(19 credits)

D. Electives (6 credits)

Prerequisites. For admission into the Ph.D. program, students will have completed a post baccalaureate degree in health and rehabilitation sciences or in a related health care discipline

Practica. Two practica are required; a research practicum (6 credit hours) involving work in the area of the student's proposed concentration and a teaching practicum (3 credit hours) involving theory and classroom teaching within the student's specialization area.

Innovative Features. The Ph.D. in Health and Rehabilitation Sciences draws on the health and life sciences disciplines for a multidisciplinary perspective. In addition to the disciplines of dietetics and nutrition, health sciences, occupational therapy and physical therapy housed in SHRS, the program will be informed by and students will be connected to biological sciences, engineering, informatics, nursing, medicine, and programs related to health policy and services. The program is also innovative in its strong research relationships with the Rehabilitation Hospital of Indiana and the Roudebush Veteran's Affairs Hospital.

Employment Possibilities. This program will prepare the future university faculty in Health and Rehabilitation Sciences. Because this is a relatively new field of study, there is a documented need for doctoral-educated individuals who can teach at universities and conduct research necessary to further the body of knowledge in a variety of settings including universities, hospitals, and the biotechnology industry. Because of the strong research component of this program and the alignment of specialties with nationally-articulated needs in research and scholarship, graduates of this program will be sought by other major research institutions that are building graduate programs in rehabilitation sciences as well as sizable rehabilitation hospitals and clinical facilities that seek to undertake research studies to inform their practice. Additionally, they would be eligible for post-doctoral fellowships in rehabilitation within their area of concentration.

B. Program Description

Proposed program and Stated Objectives. Graduates of the proposed Ph.D. in Health and Rehabilitation Sciences will become the scholars, researchers, program directors and educators who advance the body of knowledge about health and rehabilitation sciences. The proposed program is a logical next step in fulfilling the academic mission of the School of Health and Rehabilitation Sciences. However, because "rehabilitation sciences" is a relatively new discipline, and the School's mission has changed radically in the past four years to address national needs for education in health and rehabilitation sciences, the following abbreviated history and academic construct are offered as a framework within which to understand the program proposal.

Background Information. Definitions are important in the understanding of the discipline. The Institute of Medicine has stated, "*Rehabilitation* is the process by which physical, sensory or mental capacities are restored or developed through both function change in the person and changes in the physical or social environments. Rehabilitation strives to reverse what has been called the disabling process, and may therefore be called the enabling process."

Further, "*Rehabilitation science* is a field of study that encompasses basic and applied aspects of the health sciences, social sciences, and engineering. It is a melding of knowledge from several disciplines to understand the fundamental nature of the enabling-disabling process; that is, how disabling conditions develop, progress and reverse and how biological, behavioral and environmental factors can affect these transitions."[2]

Finally, the World Health Organization defines *health* as "not merely the absence of disease or infirmity but a state of complete physical, mental, and social well-being." A state of health is inextricably related to the rehabilitation process and the field of rehabilitation sciences.

National Needs. The national health needs of the disabled population and the rising rates of chronic medical conditions requiring rehabilitative care are two principal demographic forces that have emerged over the last 15 years resulting in an increasingly national focus on health and rehabilitation research. In National Health Interview Studies (NHIS) terminology, disability is defined as "activity limitation." Activity limitation is defined at three levels: (1) inability to carry out a major activity, (2) limitation in the amount or kind of major activity that can be carried out, and (3) limitation in carrying out a non-major activity. The 1994 NHIS estimate of the number of people limited in activity because of chronic conditions was 39 million, or 15 percent of the civilian non-institutionalized population.[3]

A corresponding trend is that the prevalence of chronic medical conditions leading to disability will continue to increase with the aging population and the rising rates of obesity and diabetes nationally and in Indiana. According to a RAND Corporation study, in the year 2000 45.5% (125 million) of the U.S. population was living with one or more chronic conditions. That figure is expected to rise to 48.3% (157 million) by the year 2020.[4]

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[2] Brandt, E.N. and Pope A. M. *Enabling America: Assessing the Role of Rehabilitation Science and Engineering*. Washington, D.C.: National Academy Press, 1997.
[3] *National Health Interview Studies*, 1994.
[4] Rand Corporation, 2000.

Institute of Medicine Response. To address these emerging trends, in 1997 the Institute of Medicine (IOM) published its landmark report (*Enabling America*, previously cited) containing recommendations to strengthen the nation's rehabilitation research and education infrastructure. Among the numerous recommendations put forth by the IOM, two in particular focus on building the rehabilitation research infrastructure:

- Rehabilitation science should be more widely recognized and accepted as an academic and scientific field of study. As such, the field should receive greater financial support, serve as the basis for developing new opportunities for multidisciplinary research and education, and ultimately improve the health and quality of life of people with disabling conditions.

- As the field of rehabilitation science continues to evolve and gain recognition as an academic and scientific field of study, three general priorities will and should be of fundamental importance to its growth and to the ultimate improvement of health, productivity, and quality of life for people with disabling conditions: strengthen the science, focus on the enabling-disabling process, and transfer the technology.

Research Classifications. Due to the breadth of rehabilitation science, the IOM identified four relevant research classifications:

- Pathology and Impairment Research focuses on the function of molecules, cells, organs, and organ systems as they relate to the onset and treatment of a disabling condition.

- Functional Limitation Research limits or prevents disability by enhancing the capacity to perform specific activities.

- Disability Research determines to what extent a disabling condition is a function of the natural or built environment, the culture, and/or the political, economic, or familial structures of society.

- Health Services Research examines how to best organize, deliver, and finance interventions for the disabled.

Based upon existing faculty expertise, three of these research concentrations (pathology and impairment, functional limitation, health services) will be available to students who enroll in the Ph.D. in Health and Rehabilitation Sciences program.

Federal Investment in Research. As a result of the IOM study and other reports over the last ten years, the federal government investment in rehabilitation research and training has grown through four federal agencies (National Institute on Disability & Rehabilitation Research, National Center for Medical Rehabilitation Research, Veterans Affairs, and Center for Disease Control) to levels that now exceed $400 million yearly. Another $150 million is spent on rehabilitation research by various NIH agencies through interdisciplinary programs**.**

Multidisciplinary Focus and Requirements. The federal government is now entering what should be considered Phase II of its strategic focus on funding rehabilitation research. Recognizing the importance of rehabilitation to all areas of medical care in the U.S., Congress

formed the NIH Coordinating Committee in 1990 to organize trans-NIH and trans-agency conferences in rehabilitation and establish research priorities. The most recent conference occurred in 2003 and was entitled "Physical Disabilities through the Lifespan".[5] Its principal recommendation is for the NIH to develop "a new mechanism to allow investigators to address difficult research problems in rehabilitation requiring multidisciplinary teams." In response, the NIH and the Agency for Healthcare Research and Quality have put forth an initiative entitled "Research Partnerships for Improving Functional Outcomes"[6] for basic, applied, and translational multidisciplinary research in rehabilitation involving up to 9 NIH agencies. Clearly, the most competitive regions of the country for that research funding will have built infrastructures for multidisciplinary rehabilitative research.

Relationship to Indiana University Life Sciences Strategic Plan (January 2006). National initiatives are squarely aligned with the strategic life sciences goals of Indiana University. The Foreword of the *Indiana University Life Sciences Strategic Plan* released in January 2006 notes that Indiana University will:

> "seek to leverage in a coordinated way the combined life sciences research resources on both its main campuses while defining a bold vision for their future development. IU is a partner in helping to transform the Hoosier economy, and a key result of the *Indiana University Life Sciences Strategic Plan* will be new innovations and transferable research that together will help create the basis for economic transformation and growth in Indiana."

Rehabilitation research has direct relevance to many of the 15 overarching goals listed in the strategic plan either through its role in the continuum of research, e.g.

- *Goal 5: Indiana University should build its research programs in neurosciences- basic research, translational research, advanced clinical care- so they are ranked in the top tier nationally*

or in the population it serves, e.g.

- *Goal 7: Indiana University should engage in research and education- particularly state and federally funded education efforts- that will help residents of the state of Indiana to lead healthier, better, and longer lives.*

The economic impact of rehabilitation research is made most apparent by noting that of the dozen diseases listed in the strategic plan as being most problematic in terms of annual economic cost, injury is #1 ($338 billion in national costs) and disability is #4 ($169 billion). Chronic medical conditions for which rehabilitation research is relevant (heart disease, obesity, diabetes, cancer) are also in that dozen. In *Enabling America,* with respect to rehabilitation the Institute of Medicine notes, "Cost savings, as well as clinical benefit, are clearly associated with early, aggressive intervention, vigilant and knowledgeable monitoring of chronic conditions, and appropriate use of technology."

[5] National Institute of Health Conference, *Physical Disabilities Through the Lif*espan, 2003.
[6] National Institute of Health, *Research Partnerships for Improving Functional Outcomes*.

School of Health and Rehabilitation Sciences Response. In response to these state and national trends, in 2003 the Indiana University School of Allied Health Sciences restructured and changed its name to the School of Health and Rehabilitation Sciences (SHRS) with a focus on professional and graduate education in areas relevant to rehabilitation sciences. The SHRS joins the schools of Dentistry, Medicine, and Nursing as core health schools on the IUPUI campus.

The Mission of the School of Health & Rehabilitation Sciences is to develop and maintain a scholarly and competent faculty who will provide excellence in:

- The teaching/learning process for programs in fields related to health professions;
- The advancement of knowledge through research, scholarship and creative activity, and;
- The development of lifelong commitment to civic engagement locally, nationally and globally.

To meet that mission since 2003 the SHRS has been aggressive in hiring 15 new doctoral faculty, 10 of whom have secured external funding or completed post-doctoral research training. They join the SHRS faculty in delivering professional education and research in health and rehabilitation disciplines including health sciences, nutrition and dietetics, occupational therapy, and physical therapy. There is a very competitive recruitment environment nationally for such faculty, and many peer universities have developed or are developing Ph.D. programs in health & rehabilitation sciences in response to the IOM report, NIH funding opportunities, and state life science initiatives. They include Boston University, University of Pittsburgh, Ohio State University, University of Kentucky, University of Florida, and University of Illinois-Chicago.

In 2004, the SHRS took the lead to design and charter the Indiana Center for Rehabilitation Sciences and Engineering Research, a collaborative venture among 7 schools on the IUPUI campus, the Rehabilitation Hospital of Indiana, and the Roudebush Veteran's Affairs Hospital. Housed administratively within the SHRS, the Center operates with the following three objectives:

1. To secure federal research and training grants in the area of rehabilitation science and engineering research;
2. To support other life science initiatives in the state of Indiana and at Indiana University by advancing rehabilitation sciences, rehabilitation engineering, and technology transfer;
3. To strengthen the ability of the rehabilitation research infrastructure of Indiana's health care industry to make a positive contribution to the state's economic welfare.

Degree Program Proposal. Since the SHRS has transformed itself academically and has identified a multidisciplinary center for translational research, the development of a Ph.D. program in the SHRS is a critical step in further responding to national and state initiatives to build the research infrastructure to address emerging demographics pertaining to disability and chronic disease. Further, the presence of this degree will keep the SHRS competitive in the recruitment of faculty and students nationally.

This is a proposal to award the Ph.D. in Health and Rehabilitation Sciences at IUPUI. Developing and offering a Ph.D. is part of the SHRS faculty approved 2003-09 Strategic Plan. The proposed program has been developed by an *ad hoc* faculty committee of SHRS representing faculty across all academic units in the School (Departments of Health Sciences, Nutrition and Dietetics, Occupational Therapy, and Physical Therapy). The proposal has been endorsed by the School's Academic Studies and Research Development Committee and received formal approval by unanimous vote of the entire faculty of the School.

The proposed Ph.D. program in Health and Rehabilitation Sciences will be housed in the Department of Health Sciences located in the School of Health and Rehabilitation Sciences. That department administratively houses two M.S. research degrees offered by the Indiana University Graduate School and is the administrative home for the Indiana Center for Rehabilitation Sciences and Engineering Research.

Mission and Objectives of the Proposed Program. The mission and objective of the Ph.D. program in Health and Rehabilitation Sciences is to develop research scientists and scholars to substantially contribute to the body of knowledge in health and rehabilitation and who, in turn, can teach and mentor others.

Knowledge, Values, and Skills of Program Graduates. The Ph.D. program is designed to develop in its graduates the knowledge, values, and skills necessary to enable them to:

1. Articulate the theoretical frameworks of rehabilitation with particular focus on relevance to their clinical discipline and area of concentration.
2. Describe theories of health promotion and disease prevention, particularly as they relate to disability.
3. Demonstrate enhancement of their knowledge base of health and rehabilitation sciences from an interdisciplinary perspective.
4. Analyze health services methodological approaches to rehabilitation.
5. Critically evaluate research in rehabilitation.
6. Access systematic reviews and meta-analysis databases so as to deepen their knowledge of best practices in rehabilitation.
7. Engage in substantive research in rehabilitation as it relates to their area of concentration. Students will identify a line of inquiry and develop hypotheses; choose appropriate methodology such as research design, instrumentation, and statistical analysis; collect and analyze data; and disseminate results.
8. Demonstrate an ethical approach to research activities.
9. Submit a research grant to an external agency.
10. Submit a manuscript to a peer reviewed publication.
11. Demonstrate the use of evidence based practice concepts to include the importance of considering patient/client values and preferences in their approach to rehabilitation.
12. Teach others about rehabilitation as it relates to their clinical discipline and area of concentration.

The culmination of these goals and objectives is the presentation and defense of a doctoral dissertation that makes a significant contribution in the form of an original written scholarly product that can be transmitted to others in the field through oral or written presentations.

2. Admission requirements, anticipated student clientele and student financial support.

Admission requirements. Admission into the Ph.D. program will be based on completion of a post baccalaureate degree in health and rehabilitation sciences or in a related health care discipline. Admission will also follow the policies and procedures of the Indiana University Graduate School. Such policies and procedures include formal application to the School of Health and Rehabilitation Sciences for admission to the Ph.D. program in Health and Rehabilitation Sciences; vita; personal statement; three letters of recommendation; a cumulative GPA of 3.0 on a 4.0 scale in any prior degree completion program, a letter grade of B or higher in all courses applied toward requirements; and competitive scores (minimum of 500 recommended) on the verbal and quantitative sections and a score of 3.5 or better on the analytical writing section of the Graduate Record Exam (taken within the last 5 years). A TOEFL score of 203 on the computer version (or equivalent on the iBT version) is required for applicants whose native language is not English.

Prerequisite coursework and/or degrees. A post-baccalaureate degree in health and rehabilitation sciences or a related health care discipline is required.

Clientele. The clientele for the Ph.D. will consist primarily of graduates of the School of Health and Rehabilitation Sciences or similar or related programs. Applicants will have graduated from a previous M.S. or graduate professional program related to rehabilitation such as physical therapy, occupational therapy, nutrition & dietetics, athletic training, or sports medicine. The program is designed to meet the needs of both part-time and full-time students. All students will be expected to complete at least one year or equivalent of full-time doctoral studies on the IUPUI campus.

Selection Criteria. The number of students in the Ph.D. program is expected to be small, approximately three students admitted annually, with an upper limit of approximately ten for the complete program when it is fully enrolled. These numbers are deliberately small so as to ensure that adequate resources and student funding opportunities are available to support a quality program. Enrollments will be limited by the School Admissions Committee applying the following selection criteria:

1. Leadership potential: Assessed by evaluation of vita and personal statement.
2. Ability for engaging in advanced graduate work: Assessed by evaluation of letters of recommendation, grade point average in prior graduate work, and GRE scores.
3. Learning goals and objectives: Assessed by evaluation of personal statement.

Student financial support.

Institutional: Full-time students will be eligible for support through a variety of sources to include teaching and research assistantships.

Other sources: Research grants received by SHRS faculty will provide financial support for some Ph.D. students. Stipends will be limited to full-time students. The School of Health and Rehabilitation Sciences will apply for federal funds presently available for doctoral education in rehabilitation. No new State funds are anticipated for this Ph.D. program.

Proposed Curriculum.

Curriculum requirements: The Ph.D. program in Health and Rehabilitation Sciences is based on a curriculum supported by research and teaching and a faculty already in place at IUPUI. The minimum requirements for the Ph.D. are 90 credit hours of advanced study, of which 30 semester credits may be transferred from the student's post-baccalaureate degree study, as approved by the School Admissions Committee and the University Graduate School.

The credits for the Ph.D. are distributed in the following categories:

A. Health and Rehabilitation Sciences Core Curriculum (12 credits)

All students are required to take the following courses.

SHRS W660: Rehabilitation Theories and Application (3 credits). This course explores the theories common to rehabilitation and forms a foundation for rehabilitation sciences. Included are theories specific to rehabilitation, attachment, adaptation and resilience, cognition, motor learning, empowerment, loss and grief, psycho-immunology, and the societal responses to stigmatized groups. These theories are applied to rehabilitation practice and research design across the life span. Offered every Fall semester. New course. Syllabus attached

SHRS W661: Theories of Health Promotion and Disease Prevention (3 credits). This course focuses on the role of health behaviors such as healthy eating, exercising, and avoiding unhealthy habits like smoking in health promotion and disease prevention. A principal concentration will be on health promotion within disabling conditions. Offered every Spring semester. New course. Syllabus attached

SHRS W662: Rehabilitation Services in Health Care Systems and Delivery (3 credits). This course examines the organizations and structures to deliver rehabilitation services, federal system models for rehabilitation, the multidisciplinary approach to rehabilitative care, and trends in disability. Offered every Fall semester. New course. Syllabus attached

SHRS W672: Teaching Practicum in Health and Rehabilitation Sciences (3 credits). This course offers an instructional orientation to teaching to include teaching a unit in the student's concentration area. This course may be taken more than once. New course. Syllabus attached

B. Health and Rehabilitation Sciences Areas of Concentration (30 credits)

Students will take 30 credit hours of coursework in one of three selected areas of concentration as outlined in the 1997 Institute of Medicine report entitled *Enabling America.* Students must declare an area of concentration and identify appropriate coursework within the SHRS and across campus in consultation with their Advisory Committee. It is anticipated that the coursework within each of the concentrations will vary based upon the Advisory Committee's input and the student's research area (e.g. musculoskeletal vs. neurological rehabilitation). The areas are as follows with an example of a School of Health and Rehabilitation Sciences faculty

member's research activity. An example of a 30 credit course content for each area of concentration within that faculty member's area of research is also provided:

- **Pathology and Impairment Research** - ***focuses on the function of molecules, cells, organs, and organ systems as they relate to the onset and treatment of a disabling condition.***

Stuart Warden, Ph.D., PT through the Musculoskeletal Research Laboratory researches normal and abnormal functioning of the bone, muscle, tendon, and ligament using animal and human models.

Example concentration course content for a doctoral student in the Musculoskeletal Research Laboratory:

ANAT D850 Gross Anatomy (8 cr)
ANAT D851 Histology (4 cr)
ANAT G819 Basic Bone Biology (2 cr)
ANAT D866 Electron Microscopy (2 cr)
GRAD G804 Cellular and Molecular Biology (3 cr)
PHLS F503 Human Physiology (4 cr)
GRAD G556 Methods of Humane Animal Experimentation (1 cr)
ANAT D854 Histochemistry and Cytochemistry (3 cr)

- **Functional Limitation Research** - ***limits or prevents disability by enhancing the capacity to perform specific activities.***

Tracy Dierks, Ph.D. through the Motion Analysis Research Laboratory examines the biomechanics and motor control of running and walking specific to intervention techniques to reduce injuries.

Example concentration course content for a doctoral student in the Motion Analysis Research Laboratory:

PHLS F503 Human Physiology (4 cr)
AHPT P530 Medical Conditions and Pathophysiology (3 cr)
HPER K535 Physiological Basis of Human Performance (3 cr)
HPER K530 Mechanical Analysis of Human Performance (3 cr)
AHPT P513 Functional Anatomy and Clinical Biomechanics (4 cr)
AHPT P533 Motor Control and Motor Development (2 cr)
AHPT P534 Introduction to Motor Sciences (2 cr)
HPER K533 Advanced Theories of High-Level Performance (3 cr)
INFO I510 Data Acquisition and Laboratory Automation (3 cr)
AHPT P646 Introduction to Therapeutic Interventions (4 cr)
SHRS W692 Independent Study: Readings in Kinesiology (3 cr)

Michael Justiss, Ph.D., OTR through the Driver Assessment Laboratory focuses on approaches to driver assessment, rehabilitation/remediation, and counseling for driver alternatives and community mobility options, particularly in an aging population.

Example concentration course content for a doctoral student in the Driver Assessment Laboratory:

PSY I624	Human Learning and Memory (3 cr)
PSY I675	Human Neuropsychology (3 cr)
SOC R515	Sociology of Health and Illness (3 cr)
PSY I614	Behavioral Medicine in Rehabilitation (3 cr)
GRAD G812	Fundamental Concepts in Aging (3 cr)
AHLT T572	Pathophysiology: Conditions of Occupations (3 cr)
AHLT T580	Older Adult Rehabilitation (5 cr)
AHLT T662	Occupations of Adults and Older Adults (5 cr)
AHLT T655	Technologies in Occupational Therapy (3 cr)
SHRS W692	Independent Study: Reading in Driver Assessment (3 cr)

- **Health Services Research** ***- examines how to best organize, deliver, and finance interventions for the disabled.***

Daniel Vreeman, DPT, PT through the Medical Informatics Research Laboratory focuses on the investigation of medical informatics applications to improve healthcare delivery and research, including application to rehabilitation.

Example concentration course content for a doctoral student in the Medical Informatics Research Laboratory:

SPEA V546	Health Services Utilization (3 cr)
SPHA H501	U.S. Health Care: Systems, Policies, and Ethical Challenges (3 cr)
INFO I601	Introduction to Complex Systems (3 cr)
SPHA H628	Health Care Information Systems (3 cr)
GRAD G664	Clinical Trials (3 cr)
PBHL H615	Health Services Outcomes Research (3 cr)
AHLT W540	Patient Reported Outcomes and Economic Evaluation (3 cr)
GRAD G619	Topics in Translational and Implementation Research (3 cr)
SPHA H516	Health Services Delivery and the Law (3 cr)
PBHL P611	Policy Design, Implementation and Management (3 cr)

C. Research Core (42-44 credits)

SHRS W674: Doctoral Seminar in Health and Rehabilitation Sciences (1 credit). During the first two years of a student's matriculation into the program, the student will attend a total of 12 seminars and submit reaction papers for each. Examples of seminars that may be used to fulfill this requirement would include: presentations at professional meetings, presentations as part of the seminar series hosted by the Center on Aging, and presentations as part of the seminar series hosted by the Department of Physical Therapy. The seminars will be evaluated on a satisfactory/fail grading scale. New course. Syllabus Attached

GRAD N802. Techniques of Effective Grant Writing (3 credits). This course is an intensive course/workshop designed to teach graduate students how to write and review an NIH application, and to demystify the review process. Graduate students must be at the stage of writing their dissertation and must identify a mentor or supervisor willing to participate in a

mock IRG-review of their application at the end of the course. Students will write an NRSA, R03 or K-series application. The applications will be written in sections, and students will receive individual feedback after writing the first draft of each section. In addition to the writing component, several expert guest speakers will present on the following topics: statistics, requirements for the IRB, budget and budget justification, how to set up a scientific profile to search for funding options. Students will also have the opportunity to ask questions from two senior researchers with experience reviewing NIH applications. Existing course. Offered twice during last three years.

NURS W540. Writing for Publication (3 credits). This course focuses on writing for publication. The goal is to enable students to gain skill in presenting their ideas for readers of the professional/scientific literature in any discipline. The content of the course is organized to help the student through the process from the conceptualization of an idea to submission of the paper for journal review. Achieving success and overcoming obstacles, such as lack of self-confidence in writing skills and avoidance behavior, will be emphasized. Assignments are designed to facilitate the process, and students will receive personal reviews from faculty at each stage of manuscript development. The end-product will be a paper that is ready for submission for publication. Existing course. Offered 3 times during last three years.

SHRS W670: Research Practicum in Health and Rehabilitation Sciences (6 credits).
Instructional orientation to research, arranged by student and major professor and approved by student's Research Committee. Includes research experience in student's concentration area. This course may be taken more than once. New course. Syllabus attached

9 credit hours of statistics and research design courses at the graduate level. Courses must be approved by the student's Advisory Committee as part of the student's plan of study. Following is a list of possible courses. This list is NOT inclusive but is illustrative.

NURS R505 Measurement and Data Analysis (3 credits). Principles and applications of scientific measurement, data summarization, inferential statistics, and practical derivations of the general linear model. Considers the research purpose and phenomenon under study as determinants of measurement techniques and data analysis. Existing course. Offered 7 times during last three years.

NURS R610. Qualitative Inquiry & Research Methods, (3 credits). Introduces students to the philosophical and methodological foundations of qualitative research in nursing. Students develop skills in understanding and critiquing health sciences research using qualitative designs and methods. Students acquire beginning skills in planning and conducting research in the qualitative paradigm. Existing course. Offered twice during last three years.

GRAD G651. Introduction to Biostatistics I (3 credits). The course is an introduction to biostatistics. Students learn to apply statistical techniques to the processing and interpretation of data from health studies. Topics covered include probability, descriptive statistics, study design, and linear regression, among others. Existing course. Offered 6 times during last three years

GRAD G652. Introduction to Biostatistics II, (3 credits). . The course follows G651 and provides more in-depth coverage of multiple regression and ANOVA, and introduces more advanced statistical topics such as logistic regression and survival analysis. Existing course. Offered 3 times during last three years.

AHLT W520. Critical Inquiry in the Health Sciences (3 credits). P: G651 or equivalent. Fundamental concepts of research, ranging from philosophical foundations to practical applications. Course provides the conceptual framework in which graduate students may develop their own research agenda. In keeping with the diversity of research, this course strives to introduce graduate students to the entire continuum of research paradigms, from qualitative, naturalistic inquiry to quantitative, experimental designs. Existing course. Offered 5 times during last three years

1-3 credits chosen from research ethics courses such as the following. This list is NOT inclusive but is illustrative.

GRAD G505. The Responsible Conduct of Research (1 credit). Course will provide students with a formal setting to learn about the basic rules and acceptable standards required for anyone conducting scientific research. It will help students develop skills for dealing with potential ethnical problems in the research laboratory. Course is designed for all beginning graduate students working in the life sciences or related fields. Existing course. Offered twice during last three years.

MHHS M504. Introduction to Research Ethics (3 credits). Ethical issues in designing, conducting, analyzing, and presenting research; includes historical and theoretical background as well as case studies of such issues as scientific misconduct, data management and reporting, publication practices, intellectual property, funding of research and conflict of interest, human subject research and institutional review boards, and public perceptions of science. Existing course. Offered twice during last three years.

Dissertation to include proposal (19 credits)

SHRS W690: Dissertation Proposal in Health and Rehabilitation Sciences (3-6 credits). The student will submit a written proposal for original scholarly work that makes a significant contribution to research in the field of Health and Rehabilitation Sciences. The proposal will include a comprehensive introduction to the topic, relevant literature review, and an indication of methodology to be used for the student's dissertation. The proposal must be formally presented and approved by the student's Research Committee before the student can enroll in SHRS W692. This course can be taken more than once. New course. Syllabus attached

SHRS W692: Dissertation in Health and Rehabilitation Sciences (3-8 credits). An original written dissertation is expected that makes a significant contribution to the research in the field of Health and Rehabilitation Sciences. The student will generate at least one peer-reviewed publication from the work presented in the dissertation. Topic will be selected by the student and his or her Research Committee. This course can be taken more than once. New course. Following is an example of what the dissertation

may contain:

- A detailed review of literature relevant to the thesis topic.
- A statement of hypothesis/study goals and a list of specific aims that will test the hypothesis/study goals.
- Methods and experimental design.
- Results and discussion.
- Conclusions and future directions.
- List of references cited throughout the document.

The student must successfully defend the dissertation in a formal presentation before the members of the Research Committee.

D. Electives (6 credits)

6 credit hours of elective course work at the graduate level will be taken as part of the student's plan of study. These courses must be approved by the student's Advisory Committee and should be chosen to enhance the focus of the student's area of concentration in health and rehabilitation sciences.

An Independent Study option is also available.

> SHRS W680: Independent Study: Independent Study in Health and Rehabilitation Sciences (1-4 credits). Independent study for students interested in specific interdisciplinary topics in Health and Rehabilitation Sciences. May be applied to concentration area credit hours. New course. Syllabus attached

Qualification Examination. Near, and usually in, the last semester of course work, students will be required to take a comprehensive written qualification examination in health and rehabilitation sciences, prepared by the student's Advisory Committee. Only students who pass the exam may continue in the program. Students may be able to retake the examination one time if they fail to pass the first time. The retake must occur within 6 months of the original examination.

Advisory Committee. All students will have an Advisory Committee to include at least 2 members from the student's concentration area and one from another area. At least 2 members of the committee must be members of the graduate faculty. The advisory committee shall approve the student's plan of study and counsel the student until the passing of the qualifying examination.

Research Committee. To initiate research for the dissertation, the student selects a full member of the graduate faculty (qualified to chair the research committee) who will agree to direct the dissertation. This person will normally serve as chairperson of the research committee. There shall be 2 other committee members representing the concentration area and one from each minor. Another person may be substituted for the minor representation if the student does not have a minor. The committee has the responsibility of supervising the research, reading the dissertation, and conducting the final examination. Overlap may occur among membership in the advisory and research committee.

Minor in Health and Rehabilitation Sciences. Students enrolled in doctoral and master's degree programs on campus may earn a minor in Health and Rehabilitation Sciences. Students will be required to take at least 15 credits hours focusing on health and rehabilitation sciences to include the following core courses.

SHRS W660: Rehabilitation Theories and Applications (3 credit hours)
SHRS W661: Theories of Health Promotion and Disease Prevention (3 credit hours)
SHRS W662: Rehabilitative Services in Health Care Systems and Delivery (3 credits) .

Students will need to have an additional 6 credit hours in one of the 3 concentration areas.

Sample Ph.D. in Health and Rehabilitation Sciences Curriculum (90 credits)
Area of Specialization: Functional Limitation

Each student's plan of study will be unique, depending upon his or her full-time or part-time status and previous graduate coursework. It is highly likely the students most attracted to the Ph.D. in Health and Rehabilitation Sciences will have graduated from a previous M.S. or graduate professional program related to rehabilitation (e.g. physical therapy, occupational therapy, nutrition & dietetics, athletic training, sports medicine). The course sequence and timing of courses will depend on the mix of entering full and/or part-time students and the scheduling of courses taken from other schools. Students must be registered for a minimum of 8 hours in the fall and spring semesters to be considered full time. In the summer, full time equals 4 hours. Shown below is a sample plan of study for a **full-time** student who has a graduate physical therapy degree and has entered the Ph.D. in Health and Rehabilitation Sciences program. The sample curriculum is shown for the Functional Limitation area of specialization but similar sample plans could be put forth for the other concentrations.

Courses included in the following table are illustrative and some of their descriptions are not included in this proposal.

Courses Accepted from **Previous Graduate Work** in Physical Therapy (18 credits)	PHLS F503: Human Physiology (4 credits) AHPT P530: Medical Conditions and Pathophysiology (3 credits) AHPT P513: Functional Anatomy and Clinical Biomechanics (3 credits) AHPT P533: Motor Control and Motor Development (3 credits) AHPT P534: Introduction to Motor Sciences (2 credits) AHPT P646: Introduction to Therapeutic Interventions (3 credits)
First Year Fall Semester (8 credits)	SHRS W660: Rehabilitation Theories and Application (3 credits) GRAD G651: Introduction to Biostatistics I (3 credits) SHRS W674: Doctoral Seminar in Health and Rehabilitation Sciences (1 credit) GRAD G505: The Responsible Conduct of Research (1 credit)

First Year Spring Semester (9 credits)	SHRS W661: Theories of Health Promotion and Disease Prevention (3 credits) HPER K535: Physiological Basis of Human Performance (3 credits) HPER K530: Mechanical Analysis of Human Performance (3 credits)
First Year Summer Session (6 credits)	AHLT W520: Critical Inquiry in the Health Sciences (3 credits) SHRS W672: Teaching Practicum within specialization area (3 credits)

Second Year Fall Semester (9 credits)	GRAD G652: Introduction to Biostatistics II (3 credits) SHRS W662: Rehabilitative Services in Health Care Systems and Delivery (3credits) SHRS W670: Research Practicum in Motion Analysis Laboratory (3 credits)
Second Year Spring Semester (9 credits)	NURS W540: Writing for Publication (3 credits) SHRS W670: Research Practicum in Human Performance Laboratory (3 credits) HPER K533: Advanced Theories of High Level Performance (3 credits)
Second Year Summer Session (6 credits)	Electives (6 credits)
Third Year Fall Semester (9 credits)	INFO I510: Data Acquisition and Laboratory Automation (3 credits) SHRS W690: Dissertation Proposal in Health and Rehabilitation Sciences (3 credits) GRAD N802: Techniques of Effective Grant Writing (3 credits)
Third Year Spring Semester (8 credits)	SHRS W690: Dissertation in Health and Rehabilitation Sciences (8 credits)
Fourth Year Fall Semester (8 credits)	SHRS W690: Dissertation in Health and Rehabilitation Sciences (8 credits)

Courses required for the degree that will be delivered by another institution. None.

Form of Recognition.

Type of degree to be awarded to those who complete the program: The Doctor of Philosophy degree will be awarded after completing the requirements of the Ph.D. in Health and Rehabilitation Sciences. This is appropriate because of the strong research component of the degree.

Suggested CIP Code. 51.2399

Program, organizational, and site information that will appear on the student's diploma.

The Ph.D. diploma will read: Doctor of Philosophy, Health and Rehabilitation Sciences, Indiana University.

Program faculty and administrators.

- **Core Ph.D. Program Faculty within the School of Health and Rehabilitation Sciences**

Mary Sue Brady. Rank: Professor. Specialization: Pediatric clinical nutrition. Appointment: Full time, tenured faculty, Department of Nutrition & Dietetics. Highest degree: DMSc. Professional and scholarly accomplishments, publications, etc see attached CV

Tracy Allan Dierks. Rank: Assistant Professor. Specialization: Biomechanics related to injury. Appointment: Full time, tenure track faculty, Department of Physical Therapy and Adjunct Assistant Professor, Department of Orthopedics. Highest Degree: Ph.D. Professional and scholarly accomplishments, publications, etc see attached CV

Judith Ann Ernst. Rank: Associate Professor. Specialization Pediatric clinical nutrition focused on HIV. Appointment: Full time, tenured faculty, Department of Nutrition & Dietetics. Highest degree: DMSc. Professional and scholarly accomplishments, publications etc. see attached CV

Thomas F. Fisher. Rank: Associate Professor. Specialization: Reducing and rehabilitating work related injury. Appointment: Full time, tenured faculty and Chair, Department of Occupational Therapy and Adjunct Associate Professor, School of Education. Highest degree: Ph.D. Professional and scholarly accomplishments, publications etc see attached CV

Ashraf Gorgey. Rank: Assistant Professor. Specialization: Biomechanics of exercise with focus on physiology of spinal cord injury. Appointment: full-time, tenure track in the Department of Physical Therapy. Highest degree: Ph.D. Professional and scholarly accomplishments, publication, etc., see attached CV

Michael D. Justiss. Rank: Assistant Professor. Specialization: Driving assessment, intervention, and rehabilitation. Appointment: Full time, tenure track faculty, Department of Occupational Therapy, Highest degree: Ph.D. Professional and scholarly accomplishments, publications etc. see attached CV

Joyce L. MacKinnon. Rank: Professor. Specialization: Research methods and evidence based practice in rehabilitation. Appointment: Full time, tenured faculty, Department of Health Sciences, Associate Dean for Academic Affairs. Highest Degree: Ed.D. Professional and scholarly accomplishments, publications etc. see attached CV

Christina Mushi-Brunt. Rank: Assistant Research Professor. Specialization: Public health and health education. Appointment: Full time, research track. Department of Health Sciences. Highest degree: M.S. (Ph.D. anticipated June 2007). Professional and scholarly accomplishments, publications, etc. see attached CV

Karyl Rickard. Rank: Professor. Specialization: Pediatric clinical nutrition. Appointment: Full time, tenured faculty, Department of Nutrition and Dietetics. Highest Degree: Ph.D. Professional and scholarly accomplishments, publication etc. see attached CV

Lisa Riolo. Rank: Associate Professor. Specialization: Cognition, mobility and aging. Appointment: Full time, tenured faculty and Chair, Department of Physical Therapy. Affiliated Scientist, Center for Aging Research and Affiliated Scientist, Center for Bioethics. Highest Degree: Ph.D. Professional and scholarly accomplishments, publications etc. see attached CV

Arlene Schmid. Rank: Assistant Professor. Specialization: Health services and stroke rehabilitation. Appointment: Full time, tenure track faculty, Department of Occupational Therapy and Roudebush VA Health Services Research Fellow. Highest Degree: Ph.D. Professional and scholarly accomplishments, publications etc. see attached CV

Mark Sothmann. Rank: Professor. Specialization: Human performance and exercise as an intervention strategy for medical conditions. Appointment: Full time, tenured faculty and Dean, School of Health and Rehabilitation Sciences, Interim Director, Indiana Center for Rehabilitation Sciences and Engineering Research. Highest Degree: Ph.D. Professional and scholarly accomplishments, publications etc. see attached CV

Daniel J. Vreeman. Rank: Assistant Research Professor. Specialization: Medical informatics applied to rehabilitation. Appointment: Full time, research track faculty, Department of Physical Therapy and Research Scientist, Regenstrief Institute, Inc., Indianapolis. Highest Degree: DPT. Professional and scholarly accomplishments, publications etc. see attached CV

Stuart J. Warden. Rank: Assistant Professor. Specialization: Musculoskeletal rehabilitation. Appointment: Full time tenure track faculty, Department of Physical therapy and Adjunct Assistant Professor, Department of Anatomy and Cell Biology
Highest Degree: Ph.D. Professional and scholarly accomplishments, publications, etc see attached CV

- **Supporting Faculty within the School of Health and Rehabilitation Sciences available to serve on committees to lend special expertise in health and rehabilitation sciences.**

Amy Bayliss. Rank: Clinical Assistant Professor. Specialization: Treatment of Spinal Dysfunction. Appointment: Full time clinical track faculty, Department of Physical Therapy. Highest Degree: DPT. Professional and scholarly accomplishments, publications etc see attached CV

Sara A. Blackburn. Rank: Clinical Associate Professor. Specialization: Adult clinical nutrition. Appointment: Full time clinical track faculty, Department of Nutrition and Dietetics. Highest Degree: DMS. Professional and scholarly accomplishments, publications etc. see attached CV

Jeffrey L. Crabtree. Rank: Associate Professor. Specialization: Social participation in aging. Appointment: Full time tenured faculty, Department of Occupational Therapy, Highest Degree: OTD. Professional and scholarly accomplishments, publications etc see attached CV.

Janet Everly. Rank: Clinical Associate Professor. Specialization: Pediatric occupational therapy. Appointment: Full time clinical track faculty, Department of Occupational Therapy. Highest Degree: Ed.D. Professional and scholarly accomplishments, publications etc. see attached CV.

Mary T. Loghmani. Rank: Clinical Associate Professor. Specialization: Musculoskeletal rehabilitation. Appointment: Full time clinical track faculty, Department of Physical Therapy. Highest Degree: MS. Professional and scholarly accomplishments, publications etc. see attached CV.

Jacquelynn O'Palka. Rank: Clinical Professor. Specialization: Adult Clinical Nutrition. Appointment: Full time clinical track faculty, Department of Nutrition and Dietetics. Highest Degree: Ph.D. Professional and scholarly accomplishments, publications etc. see attached CV.

Rebecca E. Porter. Rank: Associate Professor. Specialization: Neuroscience and rehabilitation. Appointment: Full time tenured faculty, Department of Physical Therapy. Highest Degree: Ph.D. Professional and scholarly accomplishments, publications etc see attached CV

Lorrie B. Ippensen Vreeman. Rank: Clinical Assistant Professor. Specialization: pediatric physical therapy. Appointment: Full time clinical track faculty, Department of Physical Therapy. Highest Degree: DPT. Professional and scholarly accomplishments, publications etc. see attached CV.

- **Affiliated Faculty Having Existing Interface with the School of Health and Rehabilitation Sciences and Available to Offer Research Support**

Rafael Bahamonde. Rank: Associate Professor, Specialization: Biomechanics and Human Performance. Appointment: Full time tenured faculty, School of Physical Education and Tourism Management. Highest Degree: Ph.D.

David Burr. Rank: Professor. Specialization: Musculoskeletal research. Appointment: Full time tenured faculty and Chair, Department of Anatomy and Cell Biology, School of Medicine. Highest Degree: Ph.D.

Alan Mikesky. Rank: Professor. Specialization: Exercise Science and Human Performance. Appointment: Full time tenured faculty, School of Physical Education and Tourism Management. Highest Degree: Ph.D.

Charles Turner. Rank: Professor. Specialization: Musculoskeletal research. Appointment: Full time tenured faculty. Highest Degree: Ph.D.

- **Credentials to Serve as Primary Advisor**. Mentoring doctoral students in the scholarly art of research and dissemination of acquired new knowledge is one of the most important contributions to scholarship within the academic community. In this pursuit of scholarship, the faculty member and student collaborate with the purpose of contributing to and advancing scientific knowledge in the content area. This form of scholarship requires substantial commitment of time and effort on the parts of the mentor and the

student. In order for this collaboration to be effective and beneficial to both mentor and student, the faculty must demonstrate an active research program within their discipline representing significant addition of new knowledge or unique application of existing knowledge in the solution of problem(s) pertinent to Health and Rehabilitation Sciences. The primary research advisor of a doctoral student must have earned a traditional research doctorate (Ph.D. or equivalent) or in the case that the terminal degree is a clinical doctorate, the individuals must have had formal post-doctoral research training with the objective of becoming an independent researcher. At a minimum, the primary mentor needs to have published his/her original research in a peer-reviewed journal as first or senior author. Primary advisors will be selected by faculty having official IU Graduate School "Endorsement" to chair doctoral dissertation committees.

- **Administrators**

Joyce Mac Kinnon, Ed.D
Interim Chair, Department of Health Sciences
Associate Dean, School of Health and Rehabilitation Sciences

Mark Sothmann, Ph.D.
Dean, School of Health and Rehabilitation Sciences

Sherry Queener, Ph.D.
Associate Dean, Indiana University Graduate School

Uday Sukhatme, Ph.D.
Executive Vice Chancellor for Academic Affairs and Dean of the Faculties

Charles R Bantz, Ph.D.
Chancellor, Indiana University-Purdue University Indianapolis
Executive Vice President, Indiana University

New faculty positions.

One new senior faculty member position will be required, not later than fall 2008. The person will have a split appointment between the Indiana Center for Rehabilitation Sciences and Engineering Research (50%) and the Department of Health Sciences, School of Health and Rehabilitation Sciences. This person will have oversight of the Ph.D. program and will deliver 2 core courses in rehabilitation in the Ph.D. curriculum. Funding for this 50% position to support the Ph.D. will be derived from new tuition.

Needed Learning Resources.

The resources necessary for students enrolled in the proposed Ph.D. program are primarily in the areas of research and teaching/learning. We are confident that our students have access to all learning resources they will need to be successful in this program.

Research: Libraries. Five separate libraries are located on the IUPUI campus—University Library, Herron School of Art Library, School of Dentistry Library, Ruth Lilly Law Library and

Ruth Lilly Medical Library (RLML). Of the five libraries, the Ruth Lilly Medical Library will be the primary source of information. The RLML collection focuses on authoritative literature in biomedical research and clinical practice. It is the only academic health sciences library in the state, and is the primary information resource for faculty, staff, and students of the Indiana University School of Medicine, School of Nursing, School of Health and Rehabilitation Sciences, and licensed Indiana health care professionals. The RLML contains more than 270,000 volumes, with current subscriptions to approximately 1900 journals, many of which can be accessed remotely via the internet, whereby students can retrieve full-text articles at anytime and from any location. For materials not available at the RLML, students can request copies from other institutions using the Document Delivery Service. This essentially means that students have unlimited access to any needed document. Articles are normally delivered electronically to the requester's desktop within a week. Requests for books are filled within two weeks.

The Library also has a growing electronic collection of 95 databases, 834 books, and 3500 journals. Important health sciences databases include MEDLINE, CINAHL, the Cochrane Database of Systematic Reviews, PsycINFO and SPORTDiscus. IUCAT is the online card catalog for the Indiana University Library system (all campuses) and can be used to find books, journals and electronic resources that are available at the Medical Library. IUCAT is accessible via the Library's web page. The Indiana University Medical Library Special Collections emphasize the practice of 19th century medicine in Indiana and other Midwestern states.

The Library's 50,000 square feet of space includes seating for 426 at study carrels and tables. There are also four rooms that can be reserved for private study, meetings or classes. The Library has a robust information technology infrastructure that includes over 30 public computer workstations as well as wireless and Ethernet connections for laptops. Remote users can authenticate through the university's Central Authentication Service and reach nearly all of the electronic resources available on campus. The library also has an electronic classroom with an instructor station, twenty student workstations, two data projectors and two SmartBoards.

Faculty librarians teach classes on a variety of topics, including: locating health information on the Internet, retrieving the best evidence literature, and information management using personal bibliographic software such as Endnote. Classes can be tailored to meet the curriculum needs of the School of Health and Rehabilitation Sciences.

Teaching/Learning: Center for Teaching and Learning. The mission of the Center for Teaching and Learning (CTL) in the Office for Professional Development is to provide leadership and scholarly expertise to stimulate and support innovation and evidence-based practices in teaching and learning through a collaborative approach that celebrates and embraces the diversity of faculty and students.

The CTL strives to create a safe and supportive environment for faculty to experiment with pioneering approaches in their teaching with strong support from consultants in instructional design and development, instructional technology, and information resources. The CTL exists solely to provide assistance to faculty in pursuit of teaching excellence.

Teaching/Learning: Preparing Future Faculty**.** The Preparing Future Faculty (PFF) program was established by the Association of American Colleges and Universities and the Council of

Graduate Schools to address a need to prepare graduate students for a future faculty career. Typically, doctoral programs are research focused and not designed to provide guidance for those interested in faculty careers. The PFF program is intended to help potential faculty by offering opportunities to gain knowledge and experience in teaching and service as well as in research. Universities and colleges are increasingly interested in hiring new faculty who are fully prepared to excel in all areas of endeavor. Since these changing expectations may not be addressed in all doctoral programs, the national PFF movement came to be.

Initiated in 2000 as a joint endeavor between the Office for Professional Development (OPD) and the university's Graduate Office , the PFF program offered at IUPUI is designed to introduce advanced graduate students and postdoctoral fellows to the full range of professional responsibilities in research, teaching, and service that will be encountered in the academy. As part of a larger effort to expand professional development in graduate education, PFF program objectives are to:

- Supplement the academic credentials of our graduate students.
- Enhance marketability of PFF participants.
- Support schools and/or departments in producing more effective and knowledgeable future faculty.
- Provide the best possible preparation for future faculty in collaboration with each individual's school and/or department.

The PFF program offered through IUPUI is not intended to replace departmental programs, but rather to enhance them. The topics covered in this program are those that are, or should be, of interest to graduate students and post-doctoral students across all disciplines seeking careers in higher education.

Teaching/Learning: Office for Professional Development

The mission of OPD is to provide leadership and scholarly expertise to stimulate and support innovation in teaching and learning, research and scholarly activity, and civic engagement at IUPUI; to engage in the transformation of the culture of IUPUI to share our work in an urban and global context; to provide a rich learning environment for a diverse student body that celebrates and embraces our differences; and to advance a culture of inquiry and the use of technology as means to support best practices

Need for additional learning resources that, if unmet, will prohibit the offering of a high quality program.

We do not anticipate needing additional learning resources.

Other program strengths.

Distinctive Features.

- **ICRSER**. A strength of the proposed Ph.D. program is the role of the Indiana Center for Rehabilitation Sciences and Engineering Research (ICRSER). ICRSER is an Indiana University approved center chartered by 7 schools on the IUPUI campus (Health & Rehabilitation Sciences, Engineering & Technology, Medicine, Nursing, Physical Education

& Tourism Management, Science, Informatics), the Rehabilitation Hospital of Indiana (RHI), and the Roudebush VA that researches new strategies, devices, and technology relevant to rehabilitation and mobility. Other collaborators in ICRSER include the Purdue University Discovery Park, Ball State's Human Performance Laboratory and biotech organizations such as Cook Biotech, Inc. and Biocrossroads. The inclusion of the Ph.D. program within the Department of Health Sciences which also houses ICRSER will provide students with a wealth of potential collaborators in their research activities—through partnerships established by ICRSER. Some of the departments and laboratories where ICRSER has interfaced include:

Department of Orthopaedic Surgery
Department of Anatomy and Cell Biology
Center for Regenerative Biology and Medicine.
Biomedical Engineering Program
Department of Electrical and Computer Engineering
Department of Mechanical Engineering
Informatics Research Institute
Human Performance and Biomechanics Laboratory ,
Regenstrief Institute, Inc,
Indiana University Center for Health Services Research,
VA Center for Excellence in Health Services Research,
Center for Aging Research.

- **Faculty Recruitment.** It is important to also note that the School of Health and Rehabilitation Sciences has recruited new faculty over the past three years with post-doctoral training that will further enhance the school's future external funding including the following:

Ashraf Gorgey, Ph.D. (Physical Therapy)- National Institute of Disability and Rehabilitation Research Post Doctoral Fellow in Spinal Cord Injury.
Lorrie Ippensen Vreeman, DPT (Physical Therapy)- Maternal & Child Health Post Doctoral Fellow in Pediatrics
Michael Justiss, Ph.D. (Occupational Therapy)- Department of Transportation Post Doctoral Fellow in Driver Safety
Arlene Schmid, Ph.D. (Occupational Therapy)- Veteran Affairs Post Doctoral Fellow in Health Services Research
Stuart Warden, Ph.D. (Physical Therapy)- National Health & Medical Research Council Post Doctoral Fellow in Musculoskeletal Research
Daniel Vreeman, DPT (Physical Therapy)- National Library of Medicine Post Doctoral Fellow in Medical Informatics

One additional faculty member with post doctoral training will be added in the 2007-08 academic year.

- **Research in the School of Health and Rehabilitation Sciences**. Following are examples of current research programs within the School.

Lab for the Interface Between Mobility and Cognition.
Principal investigator: Lisa Riolo, Physical Therapy, Ph.D., PT, NCS

The main objective of this lab is to evaluate the role of attention and memory on functional mobility in different patient groups. Attention to secondary tasks has been observed to interfere with postural control and poses more of a problem for people with impairments that require them to dedicate more of their attention on walking and avoiding obstacles. The work performed in this lab studies people with different physical problems (history of falling, Parkinson's disease, and diabetes mellitus) and the ability to predict their performance on posture and walking tasks based on their ability to maintain attention. This line of research has potential to reduce the disability and injury related to falls in the aging population. Future studies will develop and test the effects of rehabilitative interventions directed at attention and working memory on fall risk and validate the model of fall risk using a prospective study of fall occurrence.

Motion Analysis Research Laboratory (MARL)
Principal Investigator: Tracy Dierks, Ph.D.

The MARL is a multi-faceted biomechanics research center that is dedicated to investigating, understanding, and treating both normal and abnormal human movement. The primary research objectives are focused on the biomechanics and motor control of running and walking. Specific areas of inquiry include:

1. The mechanisms contributing to lower extremity running injuries
2. The role of variability in human movement patterns
3. The effect of fatigue on lower extremity function during gait
4. Intervention techniques to reduce the risk of running related injuries

Musculoskeletal Research Laboratory
Principal Investigator: Stuart Warden, Ph.D., PT

This research focuses on normal and abnormal functioning of the musculoskeletal system. It includes study of tissues such as bone, muscle, tendon and ligament, and the interactions and interrelationships between these tissues. Specific areas of inquiry include:

1. Musculoskeletal injuries and conditions (including osteoporosis, bone fractures, stress fractures, ligament injuries and tendon overuse disorders)
2. Animal and human models of musculoskeletal injuries and conditions
3. Prevention and treatment of musculoskeletal injuries and conditions
4. Skeletal mechanotransduction and the response of bone to mechanical loading

Medical Informatics Research Laboratory
Principal Investigator: Daniel Vreeman, DPT, PT.

This research focuses on understanding and promoting effective organization, analysis, management, and use of information in healthcare.

The medical informatics laboratory has two principle focus areas:

1. The use of standardized clinical vocabularies to support electronic health information exchange

2. Investigation of medical informatics applications to improve healthcare delivery and research.

The medical informatics laboratory operates in association with the Regenstrief Institute, Inc., an internationally recognized healthcare research organization dedicated to improving health through research that enhances the quality and cost-effectiveness of care. Regenstrief investigators are international leaders in medical informatics standards and electronic medical record systems, and have established the Indiana Network for Patient Care, one of the nation's oldest and largest community-wide information exchanges.

Program Exploring Fear of Falling after Stroke
Principal Investigator: Arlene Schmid, Ph.D., OTR

The Indiana University Center for Aging Research Roybal Center has funded a study to explore fear of falling after stroke. It is a longitudinal study to better understand the development and prevalence of fear of falling after stroke. The impact of fear on physical activity, participation, community mobility, and quality of life will be investigated. This research will be fundamental in future studies regarding interventions to increase physical activity in the post-stroke population.

Reducing Work Injury Through Employee Injury Prevention Education.
Principal Investigator: Thomas F. Fisher, Ph.D., OTR, CCM, FAOTA

The main objective of this research line is to explore methodologies and strategies for preventing work-related musculoskeletal disorders (WRMSs) injuries and designing ergonomic programs for employers. Employers are concerned about the escalating cost for managing WRMDs and the diminishing work force. This research program also involves providing worksite analyses and safety considerations at the University. These data are informing the employer of potential work injury risk factors, how to prevent such injuries and creating a satisfying work environment.

Social Participation in Aging Laboratory (SPA)
Principal Investigator: Jeffrey L. Crabtree, OTD, MS, OTR, FAOTA

The primary objective of this lab is to investigate the personal, social, and environmental factors that facilitate or inhibit social participation in the aging population.

Current activities include:

- Study of over 1000 Indianapolis Public Transportation Corporation (IndyGo) applicants for paratransit services to examine the demographic variables, personal and environmental factors that impact clients' ability to ride the fixed-route system.
- Development of a battery of measures to assess peoples' ability to navigate, board, ride, and disembark from fixed-route transport.
- Creation of a database of demographic, physical, psychosocial, environmental, and disabling characteristics of people who have applied for IndyGo paratransit services.
- Cost analysis of ADA paratransit protocol with objective assessments compared to an "interview only" protocol.
- Systematic Literature Review of Community Mobility and Public Transportation.
- The Meaning of Mobility—a study of the lived experience of riding Open Door, a paratransit public transportation system of IndyGo.

External Funding. Over the last several years since its restructuring, the School of Health and Rehabilitation Sciences has set forth an aggressive external funding initiative that will continue to evolve in support of a Ph.D. in Health and Rehabilitation Sciences. In 2003-04 when the school emerged from the Indiana University School of Medicine to become a free-standing school on the IUPUI campus the SHRS generated $142,000 in external funding. According to Research & Sponsored Programs records, in 2006-07 the SHRS has been awarded external grants totaling $1,568,699 as Principal Investigators. The following listing indicates the diverse nature of the research awards and the funding agencies.

- Paratransit rider assessments: Indianapolis Public Transit Corporation
- Increasing animal source foods in diets of HIV-infected Kenya women and their children. USAID Global Livestock Collaborative Research Support Program
- Leadership education excellence in pediatric nutrition: Maternal and Child Health
- Indiana-Ohio collaboration for traumatic amputation rehabilitation research: Department of Defense
- Informatics applied to health knowledge assessment: Lilly Endowment Inc.
- The effect of osteoporosis drugs on fracture repair: Eli Lilly & Co
- Tissue-level efficacy of cross-fiber massage following ligament injury: Massage Therapy Foundation

<u>Collaborative Arrangements</u>:

Another strength of this program is its proximity to hospitals already enjoying a close relationship with IUPUI and the School of Health and Rehabilitation Sciences. These hospitals are Wishard Memorial Hospital, Roudebush VA Medical Center, Riley Hospital for Children, Indiana University Hospital, Indiana University Cancer Center, Methodist Hospital, and The Rehabilitation Hospital of Indiana. Clarian Health Partners, Inc (Riley Hospital for Children, IU Hospitals, Methodist Hospital) supports IUPUI's mission of advancing education, research, and patient care in many ways. Clarion currently records 1 million patient visits per year. Wishard and Roudebush together handle another 1 million patient visits per year. This enormous patient base provides a broad range of superb clinical and research educational opportunities.

C. Program Rationale

Institutional Factors.

Compatibility with the IUPUI Mission. The Ph.D. program in Health and Rehabilitation Sciences promotes IUPUI's mission as reflected in its mission statement.

> **"**Indiana University-Purdue University Indianapolis (IUPUI), a partnership between Indiana and Purdue Universities, is Indiana's urban research and academic health sciences campus. IUPUI's mission is to advance the State of Indiana and the intellectual growth of its citizens to the highest levels nationally and internationally through research and creative activity, teaching and learning, and civic engagement. By offering a distinctive range of bachelor's, master's, professional, and Ph.D. degrees, IUPUI promotes the educational, cultural, and economic development of central Indiana and beyond through innovative collaborations, external partnerships, and a strong commitment to diversity."

The proposed program directly supports several strategies of IUPUI's strategic plan
A strategy for Excellence in Teaching and Learning reads *"Facilitate the development of new graduate degree and post-baccalaureate certificate programs to meet local, national, and global needs."* The proposed Ph.D. program meets local and national needs as described in Program Rationale above. The strong partnership with eight local hospitals and the internal/external partnerships exemplified by the Indiana Center for Rehabilitation Sciences and Engineering Research provide evidence that health and rehabilitation concerns are an integral part of the future of the institution.

The interdisciplinary nature of the proposed Ph.D. program meets another strategy of the IUPUI plan: *to encourage interdisciplinary opportunities for graduate students and post-doctoral fellows.*

A strategy for Excellence in Research, Scholarship, and Creative Activity, reads in part "*Build upon IUPUI's world-class research activities as a principal mechanism for engaging with entities in Indianapolis and Central Indiana to improve health care . . . ."* And another proposes *"Connect the research and creative strengths of IUPUI with the opportunities and needs of Indianapolis and Central Indiana."*

A strategy for Excellence in Civic Engagement, Locally, Nationally and Globally, designed to "*Increase the number of campus-community partnerships,*" is supported by the Ph.D. program, with its strong connections with the eight local hospitals and especially the Rehabilitation Hospital of Indiana and Roudebush VA. With its emphasis on health care in all its forms and the solid connections with neighboring hospitals, IUPUI provides a healthy environment for the introduction and development of a Health and Rehabilitation Sciences Ph.D. program.

Compatibility with the Indiana University Life Sciences Plan. The Ph.D. program will support the Indiana University Life Sciences Strategic Plan in strengthening the following initiatives, taken from the Strategic Plan.

Indiana University should engage in research and education . . . that will help residents of the state of Indiana to lead healthier, better, and longer lives. The emphasis here is on personal welfare and health. The top dozen diseases in the country include injury, alcohol abuse, heart disease, disability, mental illness, smoking, drug abuse, Alzheimer's, obesity, diabetes, cancer, and chronic pain. Most, if not all, of these carry some facet of rehabilitation with them. Together the annual economic costs of these diseases run into the trillion of dollars; the cost in human loss and suffering is incalculable. Research into the importance of dietetics and nutrition, coupled with health sciences, occupational and physical therapy, in assisting the large number of Indiana individuals who suffer from the above diseases will beneficially impact individuals, families, and the economic future of the state of Indiana.

Indiana University should provide strong support for Interdisciplinary Research and Service Centers on both campuses. These centers function as developers of new research technology…so that important new research techniques are created . . . . Indiana University should continue to strengthen and expand its translational research enterprise . . . .

Indiana University should educate the next generation of life scientists and help the State develop, recruit, and retain a 21st century workforce that will facilitate the growth of a life science economy in Indiana.

In all the above initiatives, the Ph.D. program will strengthen, support, and add dimension to the long-term viability of the Indiana University Life Sciences Strategic Plan.

Compatibility with the SHRS Mission. The mission of the School of Health and Rehabilitation Sciences is to develop and maintain a scholarly and competent faculty who will provide excellence in the teaching/learning process for programs in fields related to health professions; the advancement of knowledge through research, scholarship and creative activity, and the development of lifelong commitment to civic engagement locally, nationally and globally. The Ph.D. program advances this mission.

The planning process for a new program.

In late 2005, Dean Mark Sothmann created an *ad hoc* SHRS Faculty Task Force to study the feasibility and process for creating a Ph.D. in Health and Rehabilitation Sciences. That multi-discipline Task Force met in early 2006 to address the five objectives outlined in the Dean's charge.

1. Describe the context within which we are planning a Ph.D.—Indiana life sciences, IOM report, peer institutions;
2. Define the philosophical thrust of a Ph.D. for the School of Health and Rehabilitation Sciences;
3. Define particular areas of concentration with core courses;
4. Define its organizational structure and relationship to the Indiana Center for Rehabilitation Sciences and Engineering Research;
5. Assess its appeal to our current students.

The Task Force made its recommendations for the Ph.D. program in May 2006. In the late summer, Dean Sothmann contracted with the consulting firm of Smith Weaver Smith to work

with the Task Force in conducting further research, developing and writing a feasibility study and a proposal that would ultimately go to the Indiana Commission for Higher Education.

A draft Ph.D. proposal was the focus of a special School Program Review conducted by the IUPUI Office of Planning and Institutional Improvement. In February 2007 five experts reacted to the draft proposal and visited with School of Health and Rehabilitation Sciences faculty, administration, and external constituencies The 5 reviewers were:

Edward Berbari, Ph.D., Chair of the External Review Committee
Professor and Chair
Department of Bioengineering
Purdue University School of Engineering and Technology

Denny Armington, MHA
CEO
Rehabilitation Hospital of Indiana

Dan Pesut, Ph.D.
Professor and Associate Dean for Graduate Studies
Indiana University School of Nursing

Joan Rodgers, Ph.D.
Professor and Chair
Department of Occupational Therapy
University of Pittsburgh

Connie Weaver, Ph.D.
Distinguished Professor and Chair
Department of Foods and Nutrition
Purdue University- West Lafayette

The report of the external review team was received in March 2007 and their recommendations have been incorporated into this document.

The Ph.D. proposal has been endorsed by the School of Health and Rehabilitation Sciences Academic Studies and Research Development Committee and approved by the full faculty.

Impact on other programs of the institution or campus.

The proposed Ph.D. program is a logical next step for the School of Health and Rehabilitation Sciences. The School of Health and Rehabilitation Sciences is the only school of its type in the state of Indiana, having as it does a principal focus on rehabilitation education and research. Because this is a interdisciplinary research program, it will also serve to support other research programs throughout Indiana University dealing with health care and medicine. This new approach will give opportunities for the SHRS faculty to further explore the field through the new courses and research done with doctoral students. This degree program has the potential to bring new resources to the University, greatly expand the research base in nutrition and rehabilitation fields, and bring favorable publicity to the University through the close

collaboration with medicine, engineering, informatics, nursing, physiology, anatomy, and the neighboring hospitals.

The introduction of a minor in Health and Rehabilitation Sciences will enhance existing Indiana University degrees.

Letters of support for the program have been received from deans across campus who are either members of the IUPUI Council of Health Deans or of schools/departments likely to interface with a Ph.D. in Health and Rehabilitation Sciences including:

Darrell Bailey, Executive Associate Dean
School of Informatics

Ralph M. Buschbacher, Chair
Department of Physical Medicine and Rehabilitation
School of Medicine

D. Craig Brater
IU Vice President for Life Sciences
Dean, School of Medicine

Marion Broome, Dean
School of Nursing

Nicholas Kellum, Dean
School of Physical Education and Tourism Management

Oner Yurtseven, Dean
Purdue School of Engineering and Technology

Fully utilizing existing resources.

Students in this program will use multiple labs and research program facilities currently in existence on the IUPUI campus. The program will enhance the other programs whose faculty and students pursue interests in health and rehabilitation sciences in conjunction with their primarily lines of research.

Student Demand (See Table 1: Enrollment and Completion Data)

The number of students in the Ph.D. program is expected to be small, approximately three students admitted annually, with an upper limit of approximately ten for the complete program when it is fully enrolled. Students in other graduate programs would be able to enroll in courses offered in the Ph.D. program and could also designate Health and Rehabilitation Sciences as a minor.

Nine new courses will be added to the curriculum for this Ph.D. program. These are not service courses but could be electives for students in other graduate programs.

Twenty seven (27) current School of Health and Rehabilitation Sciences graduate students and adjunct faculty have expressed interest in the Ph.D. program. One of those students has already registered for an alternative Ph.D. program.

Transferability: Students will be allowed to transfer up to 30 graduate level degree hours into the program from Indiana University or another institution. Acceptability of the courses will be decided by the student's Advisory Committee.

Access to graduate and professional programs: No program graduates are anticipated to transfer to other institutions or campuses since the Ph.D. is a terminal degree.

Demand and employment factors.

There is a shortage of qualified faculty at the doctoral level in the health and rehabilitation sciences fields. A 2005 national survey of 116 physical therapy educational programs produced the following data: Of the 116 programs, almost half (52) were searching for faculty in that one year. 36 programs were searching to fill 1 vacancy, 12 were searching to fill 2 vacancies, 3 programs were searching to fill 3 vacancies, and 1 program was searching to fill more than 3 vacancies. The mean length of time that these vacancies had been open was nearly 9 months.

Nationally, the current vacancy rate for occupational therapy faculty is 25% with an estimated increase to 35% by 2012. Based on 2005 survey data, only 7% of registered dieticians are employed in education and research and only 4% of all registered dieticians hold doctoral degrees.

Regional, state, and national factors.

Comparable programs. There are no comparable programs within the region or the state. The closest comparable programs currently in existence or being developed are in adjoining states—Ohio State University, University of Kentucky, and University of Illinois-Chicago. It is critical for Indiana to have such a program within its borders.

The Ph.D. program in Health and Rehabilitation Sciences is aligned with a call given at the April 2005 Rehabilitation Research Summit in Washington DC for an increase in the research capacity for developing an agenda that responds to clinical and societal needs. The Summit engaged the leaders in the Rehabilitation field across the country, including junior and senior researchers, department chairs, deans, research directors, professional organizations, government agencies, disability consumer groups, and multiple medical specialties. A summary of the summit and its recommendations was included in the *American Journal of Physical Medicine & Rehabilitation.* "Research that is likely to enhance clinical practice," the article says, "presupposes the existence of a critical mass of investigators working as teams in supportive environments. Unfortunately, far too little research capacity of that kind exists in rehabilitation medicine to ensure a robust future for the field."[7]

External agencies. This program will meet accreditation guidelines of the North Central Association of Colleges and Schools. There is no separate accrediting agency for Ph.D.

[7] "Rehabilitation Medicine Summit," *American Journal of Physical Medicine & Rehabilitation*, December 2005, p 913.

programs in the health and rehabilitation sciences. National guidelines for Ph.D. programs and review of comparable programs across the national influenced program parameters such as number of credit hours required, resources necessary, and faculty available.

At the request of the School of Health and Rehabilitation Sciences, an external review team was appointed to review a draft of the Ph.D. program proposal. Three of the five members of the review team were from outside the IU system:

- Joan Rogers, Ph.D., OTR, Professor and Department Chair for Occupational Therapy, University of Pittsburgh
- Connie Weaver, Ph.D., Distinguished Professor and Head, Food and Nutrition, Purdue University
- Denny Armington, Master of Hospital Administration, CEO, Rehabilitation Hospital of Indiana

The timeline for this proposal has been calculated so as to go before the Indiana University Board of Trustees at its fall 2007 meeting.

D. Program Implementation and Evaluation.

Implementation. The Ph.D. program implementation will be slow and incremental and will begin in spring 2008. A senior faculty member will be hired with a split appointment between the Indiana Center for Rehabilitation Sciences and Engineering Research (ISRSER) and the Department of Health Sciences in the School of Health and Rehabilitation Sciences. This person will be responsible for Ph.D. program oversight. This is a small, start-up program in which typically a prospective Ph.D. student and a faculty member would approach the program together. Enough student interest in the proposed program exists to begin in spring 2008. Current eligible faculty will have the choice as to whether or not they choose to teach in the program.

Competencies of the Graduates. Students accepted into the PhD program will have acquired a disciplinary expertise beyond the baccalaureate level. Examples include but are not limited to dietetics, occupational therapy, and physical therapy. The background discipline is augmented by an area of concentration in the Ph.D. program. Program graduates will be educated so as to be able to use their area of specialization to engage in substantive contributions to the field of rehabilitation sciences in the areas of research, education, and health services.

Graduates of the program will be able to:

1. Articulate the theoretical frameworks of rehabilitation with particular focus on relevance to their clinical discipline and area of concentration.
2. Describe theories of health promotion and disease prevention, particularly as they relate to disability.
3. Demonstrate enhancement of their knowledge base of health and rehabilitation sciences from an interdisciplinary perspective.
4. Analyze health services methodological approaches to rehabilitation.
5. Critically evaluate research in rehabilitation.

6. Access systematic reviews and meta-analysis databases so as to deepen their knowledge of best practices in rehabilitation.
7. Engage in substantive research in rehabilitation as it relates to their area of concentration. This encompasses identifying a line of inquiry and developing hypotheses;
   choosing appropriate methodology such as research design, instrumentation, and statistical analysis; collecting and analyzing data; and disseminating results.
8. Demonstrate an ethical approach to research activities.
9. Submit a research grant to an external agency.
10. Submit a manuscript to a peer reviewed publication.
11. Demonstrate the use of evidence based practice concepts to include the importance of considering patient/client values and preferences in their approach to rehabilitation.
12. Teach others about rehabilitation as it relates to their clinical discipline and area of concentration.

Program Evaluation. The Ph.D. program will be evaluated through self-study and external review. We expect to accomplish both within five years of program implementation.

PhD Program Assessment Plan.

The following chart illustrates the components of the program assessment plan in the areas of Mission/Policies and Procedures; Resources; and Student/Graduate Competencies. In each case, "results" will be the findings of the assessment and "necessary action" will be the recommended changes for continuous improvement of the program and its outcomes.

Each of the goals listed has been identified as critical to the mission and success of the Ph.D. program. While attainment of most of the goals can be assessed while students are enrolled in the program, some goals are best assessed by determining what students do after graduation, such as enroll in post doctoral fellowships, accept positions in academia, submit grants or publish their research. These goals are best assessed through graduate and employer surveys.

Many of the goals should be assessed annually, especially those related to policies and procedures and availability of necessary resources. Other more complex goals, as well as the primary focus of the Ph.D. degree, may be best assessed in a review format such as a five year review that would include reviewers both internal and external to the IUPUI campus.

Mission/Policies and Procedures

Goal	Frequency of Assessment	Responsible Person/Office	How Assessed	Documents to be Used	Benchmarks	Results	Necessary Action
Program congruent with IU mission	annually	program director	compare program mission with IU mission	program mission statement IU mission statement	All documents congruent		

Program congruent with SHRS mission	annually	program director	compare program mission with SHRS mission	program mission statement SHRS mission statement	All documents congruent		
Program adheres to IU Graduate School requirements	annually	program director school Graduate Affairs Committee representative	compare program requirements and guidelines with IU Graduate School requirements and guidelines	program requirements and guidelines IU Graduate School requirements and guidelines	All requirements and guidelines congruent		
Program information disseminated is accurate	on-going	program director SHRS associate dean	review all dissemination material	SHRS website all written program materials	All materials accurate		
Admissions requirements are correlated with program success	bi-annually once first cohort has graduated	program director ASRD Committee	correlate admissions requirements with student success	admissions requirements student academic progress and graduation data	All students who meet admissions requirements and are accepted into the program remain in good academic standing and graduate from the program		
Students progress through the program in a timely manner	bi-annually	program director	track student progress	student plan of study student transcripts	All students demonstrate timely progress		

Resources

Goal	Frequency of Assessment	Responsible Person/Office	How Assessed	Documents to be Used	Benchmarks	Results	Necessary Actions
Qualified faculty are available	bi-annually	program director ASRD Committee	review faculty availability to participate in PhD program	faculty lists	Each student has an identified faculty mentor Each student has an advisory committee Each student has a research committee		
Required courses are available	bi-annually	program director ASRD Committee	review course offerings	course listings	Courses are offered when they are advertised to be offered		
Laboratory space is available	bi-annually	SHRS W670 course instructor	review laboratory space availability	laboratory lists	All students have access to a laboratory in their area of interest		
Teaching opportunities are available	bi-annually	SHRS W672 course instructor	review teaching opportunities available	teaching opportunities	All students have a teaching opportunity in an area of interest		
Student stipends are available	bi-annually	program director ASRD Committee	quantity of stipends available	stipend lists	All full time students admitted to the program have access to a student stipend		

Student Competencies Graduates of the program will be able to:

Goal	Frequency of Assessment	Responsible Person/Office	How Assessed	Documents to be Used	Benchmarks	Results	Necessary Actions
Articulate the theoretical frameworks of rehabilitation with particular focus on relevance to clinical discipline and area of concentration	2 years after program implementation 5 year review	student's Advisory Committee SHRS W660 course instructor	course grade performance on comprehensive exam	grade in SHRS W660 comprehensive exam results	Each student to pass SHRS W660 Each student to pass the comprehensive exam		
Describe theories of health promotion and disease prevention	2 years after program implementation 5 year review	student's Advisory Committee SHRS W661 course instructor	course grade performance on comprehensive exam	grade in SHRS W661 comprehensive exam results	Each student to pass SHRS W661 Each student to pass the comprehensive exam		
Demonstrate enhancement of knowledge base of health and rehabilitation sciences from an interdisciplinary perspective	2 years after program implementation 5 year review	student's Advisory Committee	course grades performance on comprehensive exam	grades in PhD core courses comprehensive exam results	Each student to pass all PhD core courses Each student to pass the comprehensive exam		
Analyze health services methodological approaches to rehabilitation	2 years after program implementation 5 year review	student's Advisory Committee SHRS W662 course instructor	course grade performance on comprehensive exam	grade in SHRS W662 comprehensive exam results	Each student to pass SHRS W662 Each student to pass the comprehensive exam		
Critically evaluate research in rehabilitation	2 years after program implementation 5 year review	student's Research Committee SHRS W690 course instructor	course grades dissertation work	grade in AHLT W520 or equivalent grade in SHRS W690 completed dissertation	Each student to pass AHLT W520, SHRS W690 Each student to have his/her dissertation accepted		

Access systematic reviews and meta-analysis databases	2 years after program implementation 5 year review	student's Research Committee SHRS W690 course instructor	course grades dissertation work	grade in AHLT W520 or equivalent grade in SHRS 690 completed dissertation	Each student to pass SHRS W690 Each student to have his/her dissertation accepted		
Engage in substantive research in rehabilitation as it relates to their area of concentration	one year after first cohort graduates; bi-annually	program director ASRD Committee	review of research activities upon graduation	feedback on graduate survey	Each graduate to be involved in substantive research one year post graduation		
Demonstrate an ethical approach to research activities	bi-annually	student's Research Committee	performance in research practicum feedback from employers	research practicum feedback feedback on employer survey	Each student to pass the research practicum Employer feedback positive		
Submit a research grant to an external agency	one year after first cohort graduates; bi-annually	program director ASRD Committee	submission of a grant	external grant submission graduate survey	Each student to submit a research grant within 2 years post graduation		
Submit a manuscript to a peer reviewed publication	one year after first cohort graduates; bi-annually	program director ASRD Committee	submission of a manuscript	manuscript submission graduate survey	Each student to submit a manuscript within 2 years post graduation		
Demonstrate the use of evidence based practice concepts	bi-annually	program director ASRD Committee AHLT W520 instructor	course grade self-reflection	grade AHLT W520 or equivalent graduate survey	Each student to pass AHLT W520 Each student to demonstrate use of these concepts as measured by the graduate survey		
Teach others about rehabilitation as it relates to the discipline and area of concentration	bi-annually	SHRS W672 instructor	performance in teaching practicum feedback from employer	teaching practicum feedback employer surveys	Each student to pass SHRS W672 Employer feedback positive (if relevant)		

Graduates of the program are employed upon graduation OR are accepted into post graduate fellowships	one year after first cohort graduates; bi-annually	program director ASRD committee	employment records fellowship offers	graduate survey	All graduates of the program are either employed or have been accepted into a fellowship one year post graduation		

1. **Table 1: Enrollment and Completion Data (see Appendix).**

2. **Tables 2A and 2B: Cost and Revenue Data (see Appendix)**