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May 11, 2016

MEMORANDUM

TO: State Board of Regents

FROM: David L. Buhler

SUBJECT: University of Utah – Doctor of Philosophy in Nutrition and Integrative Physiology

Issue

The University of Utah requests approval to offer a Doctor of Philosophy (PhD) in Nutrition and Integrative Physiology effective fall 2016. The institutional Board of Trustees approved the degree on January 12, 2016.

Background

The proposed PhD in Nutrition and Integrative Physiology is a product of a significant realignment of academic units and faculty in the University's College of Health approved by the Board of Regents in 2015. As part of that realignment, a new Department of Nutrition and Integrative Physiology was formed, bringing together nine tenure-line faculty members from the fields of Nutrition and Exercise and Sport Science. These current faculty members are actively engaged in ongoing research necessary to mentor PhD students in the proposed program. Two additional tenure-line faculty hires (chair/professor and assistant or associate professor) are anticipated. Collaborative relationships have also been established with other academic departments and research facilities across the University that would support the proposed degree. All of this would provide the necessary faculty and research capacity to prepare PhD graduates with the background needed to conduct independent research and pursue positions in academic settings or industry.

The proposed PhD in Nutrition and Integrative Physiology is comprised of 21 core credit hours, 9-9.5 credit hours in an emphasis area, 6 elective credit hours, and 36 dissertation research credit hours, for a total of 72-72.5 credit hours. According to the U.S. Department of Labor's Bureau of Labor Statistics, employment of medical scientists, Registered Dietician Nutritionists, and nutritionists is projected to grow at double-digit percentage rates between 2012 and 2022. Furthermore, faculty positions in Nutrition and Integrative Physiology have been difficult to fill across the nation, pointing to a need for more PhD graduates. Finally, the proposed PhD in Nutrition and Integrative Physiology is supported by Graduate Council reviews conducted by the University in 2010 and 2015.

Policy Issues

The proposed degree has been developed and reviewed in accordance with processes established by the University of Utah and the Board of Regents. The Utah System of Higher Education (USHE) Chief Academic Officers and appropriate faculty at other USHE institutions have reviewed and are supportive of the University of Utah's request to offer a PhD in Nutrition and Integrative Physiology. There are no additional policy issues relative to approval of this program.

Commissioner's Recommendation

The Commissioner recommends the Regents approve the request by the University of Utah to offer a Doctor of Philosophy in Nutrition and Integrative Physiology.

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David L. Buhler
Commissioner of Higher Education

DLB/GVB
Attachment

Program Description
University of Utah
Doctor of Philosophy in Nutrition and Integrative Physiology

Section I: The Request

The University of Utah requests approval to offer a Doctor of Philosophy (PhD) in Nutrition and Integrative Physiology effective in fall 2016. The institutional Board of Trustees approved the degree on January 12, 2016.

Section II: Program Description

Complete Program Description

The mission of the doctoral program in Nutrition and Integrative Physiology is to advance the scientific knowledge of nutrition and integrative physiology through the development of expertise in research, teaching, and professional leadership. The College of Health offers Master of Science degrees in both Nutrition and Kinesiology for students interested in professional and clinical practice. The doctoral program in Nutrition and Integrative Physiology will award a PhD degree focusing on preparing individuals with the expertise needed to conduct independent research and obtain positions as faculty members in academic institutions or industry. The presence of graduate students enrolled in the PhD program will enhance the academic experience of master's and bachelor's students by increasing scholarly activity in the Department and providing PhD student Teaching Assistants in instruction.

Purpose of Degree

Nutrition and exercise are important aspects of quality health care. Together, they are critical for prevention and treatment of the leading causes of death and disability in the United States: heart disease, stroke, cancer, diabetes, obesity, and arthritis (Centers for Disease Control and Prevention, 2015). Eighty-six percent of all health care spending in 2010 was for people with one or more of these preventable chronic medical conditions (Leroy et al., 2014).There is a corresponding need to prepare scholars committed to advancing the scientific basis for nutrition and exercise recommendations and to examine the clinical outcomes of evidenced-based nutrition and exercise activities. Scholars who have expertise in both nutrition and integrative physiology are uniquely positioned to expand the knowledge base of prevention and treatment of chronic lifestyle related diseases while employed in academic or industry research.

Institutional Readiness

The creation of a PhD program is a primary objective of the Division of Nutrition's current strategic plan and has been a goal for the past decade. The past two Graduate Council reviews (2008 and 2015) encouraged formation of a doctoral program once the Department had a substantive number of tenure-track faculty. Both the internal and external teams encouraged the faculty to work towards a doctoral degree to enhance faculty progress in obtaining research funding and producing peer-reviewed publications. Faculty expressed interest in a systematic and rigorous approach to a doctoral program. The Board of Regents approved a realignment of the College of Health in 2015 which brought together faculty from Nutrition and Exercise and Sport Science to form the Department of Nutrition and Integrative Physiology (NUIP). The new Department will have nine tenure-line faculty members actively engaged in ongoing research agenda

with the ability to mentor PhD students and increase scholarly activity. Faculty members in the Department have extensive experience working with doctoral students, as primary mentors or as supervisory committee members in other departments. These faculty members have developed collaborative relationships with faculty members and research facilities in other colleges and departments, including the Diabetes and Metabolism Research Center, Department of Biomedical Informatics, Department of Medicinal Chemistry in the College of Pharmacy, Department of Pediatrics, Social and Behavioral Sciences, Department of Family and Preventive Medicine, Department of Biochemistry, College of Nursing, and Veterans Administration Medical Center.

Facilities and resources are in place for a PhD program, including administrative support and classroom facilities, because the Department already administers a master's-level program and an undergraduate minor. The Department also has an existing biochemistry laboratory and human performance laboratory in HPER North, shared laboratory space in the biomedical core in the medical school, and significant dedicated laboratory space in the Veterans Administration Medical Center.

A work group of tenure-line and career-line faculty members has crafted the curriculum and proposal for the PhD program in Nutrition and Integrative Physiology. The proposal has been approved by the entire faculty by a vote of 21 (yes) to 0 (no) and 4 (no response) by email following review at the September 28, 2015 faculty meeting. On October 2, 2015, the proposal was approved by the College of Health curriculum committee.

Departmental Faculty

Department Faculty Category	Dept. Faculty Headcount – Prior to Program Implementation	Faculty Additions to Support Program	Dept. Faculty Headcount at Full Program Implementation
With Doctoral Degrees (Including MFA and other terminal degrees, as specified by the institution)			
Full-time Tenured	6	1	7
Full-time Non-Tenured	4	1	5
Part-time Tenured	0	0	0
Part-time Non-Tenured	2	0	2
With Master's Degrees			
Full-time Tenured	0	0	0
Full-time Non-Tenured	7	0	7
Part-time Tenured	0	0	0
Part-time Non-Tenured	5	0	5
With Bachelor's Degrees			
Full-time Tenured	0	0	0
Full-time Non-Tenured	0	0	0
Part-time Tenured	0	0	0
Part-time Non-Tenured	1	0	1
Other			
Full-time Tenured	0	0	0
Full-time Non-Tenured	0	0	0

Part-time Tenured	0	0	0
Part-time Non-Tenured	0	0	0
Total Headcount Faculty in the Department			
Full-time Tenured	6	1	7
Full-time Non-Tenured	11	1	12
Part-time Tenured	0	0	0
Part-time Non-Tenured	8	0	8
Total Department Faculty FTE *(As reported in the most recent A-1/S-11 Institutional Cost Study for "prior to program implementation" and using the A-1/S-11 Cost Study Definition for the projected "at full program implementation.")*	21	2	23

Current tenured and tenure-line faculty have prepared the curriculum and programming, and believe the doctoral program will add to their abilities to garner funding and conduct scholarly research; therefore, they are willing to take on the additional duties associated with the program. Two additional faculty lines will be filled by Year 2. A search is in progress so that, by the start of Year 1, the Department will have a new Chair with an independent line of research. This individual will have at least one line to fill, bringing the total department faculty FTE to 23.

Staff

No additional staff will be required to support the doctoral program in Nutrition and Integrative Physiology for the first five years. The existing staff of 3.35 FTE (accountant, program coordinator, executive secretary, and part-time office assistant) will be able to provide support to the program given the limited number of students who will be admitted to the program in the early stages.

Library and Information Resources

Library resources required for a doctoral program in Nutrition and Integrative Physiology include access to biomedical research databases that include journals and reference materials related to nutrition, integrative physiology, and related fields. Existing resources of the Eccles Health Sciences Library include access to 300+ nutrition journals, 36 integrative physiology journals, and 800+ journals related to nutrition and physiology basic science. Additionally, the director of the Eccles Library has indicated the library staff is willing to order additional resources as deemed necessary. Librarians are also available to provide one-on-one or group consultations to doctoral students as they apply for grants and write their research proposals and dissertations. Further, they are available for student training on reference software, presentation software, and online education and reference tools related to nutrition and integrative physiology.

Admission Requirements

Applicants for admission to the doctoral program must be admitted by the Graduate School and the Department of Nutrition and Integrative Physiology at the University of Utah. Applicants should have a strong interest in research, teaching, and service in the field. Applicants must have an earned master's degree in nutrition, integrative physiology, or a related field in health sciences; however, the exceptional

student with a bachelor's degree in nutrition, integrative physiology, or a related field in the health sciences may be considered. A master's degree in an area related to the health sciences is desirable.

The following information must be submitted to the Graduate School for consideration of admission:

1. Graduate Admissions Application
2. Official transcripts of undergraduate and graduate course work
3. For international students, a Test of English as a Foreign Language (TOEFL)

The following information must be submitted to the Department of Nutrition and Integrative Physiology:

1. A current curriculum vitae
2. Report of the Graduate Record Exam (verbal, quantitative, and analytical) taken within the past five years
3. A written statement (less than 1000 words) of research experience and interest and long-term career goals
4. Three letters of recommendation from individuals with knowledge of the applicant's potential for success in a doctoral program

Admission to the Doctoral Program in Nutrition and Integrative Physiology will require:

1. Acceptance to the Graduate School at the University of Utah:
    a. A bachelor's degree from a regionally-accredited college/university
    b. At least a 3.00 or higher weighted mean GPA (undergraduate and graduate GPA. If the GPA is below 3.00, a GPA will be calculated on the last 60 semester hours (90 quarter hours) the student has completed.
2. Availability of faculty mentor resources that match the student's research interests
3. Recommendation for admission from the department's selection committee

Student Advisement

Each student will be matched with a faculty advisor prior to acceptance to the doctoral program. This faculty advisor will assist the student in developing a plan of study and will oversee the composition of a supervisory committee that will be identified following the student's first year. The supervisory committee must be approved by the faculty advisor and will be responsible for providing additional advisement to the student throughout his or her course of study.

Justification for Graduation Standards and Number of Credits

The total number of hours required by the doctoral program in Nutrition and Integrative Physiology is consistent with other PhD programs at the University of Utah and in comparable programs offered at other institutions. It is also standard to require a qualifying exam, a written dissertation, and oral defense of the dissertation as described under *Expected Standards of Performance*.

The following table summarizes a number of integrated physiology/nutrition/bioscience programs around the United States. Well-known programs at universities that are historically strong in Nutrition science

and/or Integrative Physiology were selected and represent examples from sister institutions at PAC-12, BIG-10, and similar schools.

Institution	Program	Number of Credits & Program Notes	Administering Department
Utah State University	Nutrition, Dietetics, Food Science PhD	• 70 credits beyond BS degree • 40-67 credits from coursework, 18-27 credits from research • Also option for entry with MS degree	Department of Nutrition, Dietetics, and Food Science
Georgia Tech	Applied Physiology PhD	• 42 credits beyond MS degree • 12 dissertation hours	School of Applied Physiology
Purdue University	Interdepartmental Nutrition PhD	• 90 credits beyond BS degree • 29 credits minimum from coursework, balance from research credits	Department of Foods and Nutrition
Kansas State University	Kinesiology PhD	• 90 credits beyond BS degree • 30 dissertation hours	Department of Kinesiology
Kansas State University	Human Nutrition PhD Areas of emphasis include: Physical Activity, Public Health Nutrition, and Nutrition Sciences	• 90 credits beyond BS degree • 22 credits minimum from coursework, 30 credits minimum from research	Department of Human Nutrition
The Ohio State University	Interdisciplinary Nutrition PhD	• 80 credits beyond BS degree • MS credits may count for 30 of 80 hours • 32-41 credits from coursework, balance from research credits	Colleges of Education & Human Ecology, Agricultural & Environmental Sciences, Medicine, and Veterinary Medicine
Oregon State University	Nutrition PhD	• 108 credits beyond BS degree	School of Biological and Population Health Sciences

		• 36 minimum credits from research	
University of Oregon	Human Physiology PhD	• 15 credits beyond BS degree	Department of Human Physiology
University of Wisconsin	Biochemical & Molecular Nutrition PhD	• Minimum 73 credits beyond BS degree • 22 coursework, 51 research • Statistics required, but not included in credit hour total	Department of Nutritional Sciences
University of Washington	Nutritional Sciences PhD	• Minimum 103 credits beyond BS degree • 55-65 from coursework, 27 from research	Department of Public Health
University of Colorado	Integrative Physiology PhD	• 30 credits above 5000 level, plus dissertation hours	Department of Integrative Physiology
University of Florida	Nutrition Sciences PhD Exercise Physiology PhD	• 90 credits beyond BS degree, 60 credits beyond MS degree • Minimum 22 credits from coursework, balance of credits from research	Center for Nutritional Sciences Department of Applied Physiology and Kinesiology
University of South Carolina	Exercise Science PhD	• 30 credits beyond MS degree	Department of Exercise Science
University of Texas	Nutrition Sciences PhD Kinesiology PhD	• 60 credits minimum beyond BS degree • 24 credits coursework, balance from research credits • 48 credits beyond MS degree, including 18 dissertation hours	Department of Nutritional Sciences Department of Kinesiology and Health Education

External Review and Accreditation

The professional master's program in the department (Coordinated Master's Program in Nutrition) is accredited by the Academy of Nutrition and Dietetics (AND); however, AND does not accredit PhD programs, nor do other professional organizations in nutrition science or integrative physiology (e.g.,

American Society of Nutrition, American College of Sports Medicine, American Physiological Society). The program proposal for the doctorate in Nutrition and Integrative Physiology has been reviewed by the Dean of the College of Health, contributing faculty from other programs at the University of Utah, and outside entities.

Projected Program Enrollment and Graduates; Projected Departmental Faculty/Students

Data Category	Current – Prior to New Program Implementation	PROJ YR 1	PROJ YR 2	PROJ YR 3	PROJ YR 4	PROJ YR 5
Data for Proposed Program						
Number of Graduates in Proposed Program	X	0	0	0	2	4
Total # of Declared Majors in Proposed Program	X	2	4	7	9	10
Departmental Data – For All Programs Within the Department						
Total Department Faculty FTE *(as reported in Faculty table above)*	21	23	24	25	26	27
Total Department Student FTE *(Based on Fall Third Week)*	285*	287**	291**	298**	307**	317**
Student FTE per Faculty FTE *(ratio of Total Department Faculty FTE and Total Department Student FTE above)*	13.6:1	12.5:1	12.1:1	11.9:1	11.8:1	11.7:1
Program accreditation-required ratio of Student FTE/Faculty FTE, if applicable	NA					

*includes current MS program and UG minor
**includes MS program, UG minor, and PhD

Expansion of Existing Program

Not applicable

Section III: Need

Program Need

The Department of Nutrition and Integrative Physiology is one of five departments in the College of Health at the University of Utah following the recent realignment of the College approved by the Board of Regents in July 2015. Prior to realignment, the Division of Nutrition included the development of a PhD program in its strategic planning, but was limited by the small number of tenure-track faculty. Realignment of the College provides the opportunity for the new Department of Nutrition and Integrative Physiology to develop a unique doctoral degree that focuses on the intersection of nutrition and exercise physiology. Currently, the Department of Nutrition and Integrative Physiology offers a Coordinated Master's Program in Nutrition

and Dietetics and a master's degree in Nutrition Science. Each year, there are highly-qualified master's students in the department who wish to pursue a PhD degree; however, there is not an option to meet the student demand for doctoral studies. With realignment, there will be nine tenure-track faculty in the newly-formed Department to mentor PhD students. Therefore, doctoral study in Nutrition and Integrative Physiology is proposed to meet the educational needs of students interested in scholarly research.

The need for a doctoral program is supported by the Graduate Council reviews. The past two Graduate Council reviews (2010 and 2015) have recommended formation of a doctoral program once the department attained additional tenure-track faculty to support the departmental research mission. Specifically, the review emphasized the role of the new PhD program in enhancing faculty research productivity via grant funding. Additionally, the creation of a PhD degree is integral to the recruitment and retention of highly-qualified faculty in nutrition and exercise physiology.

Labor Market Demand

According to the Bureau of Labor Statistics, employment of medical scientists is projected to increase 13% from 2012 to 2022, and employment of Registered Dietitian Nutritionists (RDNs) and nutritionists is projected to grow 21% from 2012 to 2022, faster than the average for all other occupations. The role of food in preventing and treating illnesses, such as diabetes, is now well known. More RDNs and nutritionists will be needed to provide care for patients with various medical conditions and to advise people who want to improve their overall health. Other factors affecting the demand for RDNs and integrative physiologists include the aging population, health care reform, and increased employment opportunities in the food industry (Rhea and Bettles, 2012). Furthermore, the Commission on Dietetic Registration recently acted to change the educational requirement for an entry-level RDN from a baccalaureate degree to a graduate degree effective January 1, 2024. Nationwide, approximately 4% of RDNs have doctoral degrees, according to the Academy of Nutrition and Dietetics Compensation and Benefits Survey (Ward et al., 2012). At the departmental level, there has been a steady increase in enrollment in the Coordinated Master's Program in Nutrition and Dietetics (n=26, 2012-2013 to n=30, 2015-2016) and Online Master's in Nutrition Science degree programs (n=0, 2012-2013 to n=9, 2015-2016).

Overall, there are limited numbers of PhD-trained RDNs to serve as faculty in dietetic education programs, at a time when there is increased demand for graduate dietetic education. In fact, the Dietetics Workforce Demand Task Force concluded: "In higher education, the need for faculty prepared at advanced levels, especially the doctoral level, continues to be high" (O'Sullivan Maillet et al., 2012). Additionally, alternative career paths for PhD-trained scientists include strong employment opportunities in industry and governmental agencies. In Utah, academic positions in Nutrition and Integrative Physiology have been difficult to fill, further indicating need for a program. Nationally, there are over 30 academic programs in integrative physiology that have open positions for faculty members.

To meet the Governor's call that 66% of Utahns have a post-secondary degree or certificate by 2020, Utah will need to have additional faculty members in higher education that can provide coursework and mentorship to those seeking undergraduate degrees, including coursework for major and minor degrees and general education in the science, technology, engineering, and math (STEM) areas, which includes biomedical sciences such as nutrition and integrative physiology. The Department of Nutrition and Integrative Physiology teaches approximately 1,800 undergraduate students each year at the University of Utah, online, and at outreach education centers. Doctoral-trained faculty members are needed to meet the demands of the growing number of students interested in master's degrees and licensed as registered

dietitians and those interested in industry research who will provide cutting-edge research and development skills to Utah employers.

Student Demand

Department exit surveys of the past decade indicate that 5-6 well-prepared master's students each year are interested in pursuing a doctoral degree in Nutrition and/or Integrative Physiology and staying at the University of Utah. Based on alumni surveys during the same time period, approximately 40% of graduates interested in a PhD degree attend doctoral programs outside of Utah and 60% state they remain interested in a doctoral degree, if offered locally. Finally, 3-5 doctoral students in the Biosciences program at in the School of Medicine inquired about a Nutrition and Integrative Physiology research project in 2015, typical of inquires in the past five years. Preparation for the PhD program requires a master's degree in Nutrition or Integrative Physiology or a related biomedical field such as Exercise Physiology, Biology, Chemistry, or a similar field.

Similar Programs

There are no doctoral programs in Nutrition and Integrative Physiology within the Utah State Higher Education System. There is USU's doctoral program in Nutrition and Food Science, which focuses on the chemical and biological components of food and ways in which these ingredients affect health. Utah State's strong history as an agricultural university has produced a program with a strong reputation in nutrition, particularly related to meat and dairy applications. There are similarities in the research opportunities for students at USU, particularly in studying the chemical components of foods that affect health, as well as clinical and public health applications of nutrition. Utah State University also offers a PhD in Pathokinesiology within the doctoral program in Disability Disciplines.

The proposed program in Nutrition and Integrative Physiology at the University of Utah differs significantly from the programs at USU in that it focuses primarily on the biomedical sciences and provides unique opportunities for collaboration between nutrition and integrative physiology researchers. It builds upon the strengths of the University of Utah Health Sciences Center in biomedical-focused scholarly activities in a health science environment that is unique among the Utah System of Higher Education and to the University of Utah. Furthermore, this doctoral program will encourage greater collaboration between the Diabetes, Metabolism and Obesity Research Center and the Department, resulting in excellent interdisciplinary learning opportunities for graduate students. It enhances the ability of colleagues in the health sciences to incorporate exercise and nutrition questions into their own research and break down silos in research related to energy metabolism and its influence on diabetes, obesity, and cardiovascular diseases, among others.

Collaboration with and Impact on Other USHE Institutions

Utah State University's Nutrition, Dietetics, Food Science PhD Program faculty are aware and supportive of a PhD program proposal in Nutrition and Integrative Physiology. The programs have historically collaborated in setting curriculum for dietetics students in Utah and as members of the Utah Academy of Nutrition and Dietetics. Additional collaboration has occurred informally through sharing of research methods or results in the areas of dietary assessment and education program outcomes. The proposed doctoral program will not have an impact on enrollment in doctoral programs at other USHE institutions as the program is significantly different in scope.

Benefits

The proposed doctoral program in Nutrition and Integrative Physiology will benefit the Utah System of Higher Education, in general, and the University of Utah, in particular, by better serving students in Nutrition and Integrative Physiology. The University of Utah would benefit by attracting additional high-quality students into undergraduate and master's programs that can lead to a doctoral degree. The addition of doctoral students to the Department of Nutrition and Integrative Physiology will enhance the educational experience of the Dietetics and other Nutrition students, as well. The national reputation of the University of Utah will be enhanced as students graduate from the program and become productive researchers, teachers, and professional leaders.

The program will also increase the amount of research conducted through the Department of Nutrition and Integrative Physiology with the enhanced opportunity to obtain funding from federal and not-for-profit sources. Furthermore, the program will provide additional opportunities for collaborative research across main campus and the health sciences campus.

Consistency with Institutional Mission

The mission of the Department of Nutrition and Integrative Physiology is to improve the health of a diverse world through training the next generation of health professionals that will expand the scope of knowledge in exercise physiology, nutrition, and disease prevention through research and discovery, education, and community engagement.

This departmental mission aligns with the following institutional mission statement: "The mission of the University of Utah is to serve the people of Utah and the world through the discovery, creation and application of knowledge; through the dissemination of knowledge by teaching, publication, artistic presentation and technology transfer; and through community engagement." Specifically, the doctoral program in Nutrition and Integrative Physiology aims to develop strong, science-based independent researchers for careers as scientists in the fields of nutrition and integrative physiology. This aim is congruent with the mission of the Department of Nutrition and Integrative Physiology to improve the health of a diverse society by training the next generation of professionals in nutrition and integrative physiology. In turn, all these statements reflect the University mission to serve the people of Utah and the world through discovery, teaching, and community engagement. The students, graduates, and faculty of the Department of Nutrition and Integrative Physiology will participate in research, teaching, and service to their communities as both volunteers and professionals, which links the Department explicitly to the University's four big goals: Promote student success to transform lives; Develop and transfer new knowledge; Engage communities to improve health and quality of life; Ensure long-term viability of the organization.

Section IV: Program and Student Assessment

Program Assessment

This program is not subject to accreditation from a specific agency. As a graduate program at the University of Utah, the program will be subject to review from the Graduate Council. In addition, the Department of Nutrition and Integrated Physiology will extend the program assessment procedures used to evaluate the Coordinated Master's Program (CMP) to the PhD program.

Coordinated Master's Program Graduation Survey – Students are provided with the link to the survey via the REDCap web-based application, following the release of the thesis from the Graduate School. The survey asks students to rank the program in the following areas: developing competent professionals with advanced degrees who are prepared for dietetic careers in a variety of environments; preparing graduates of all tracks and concentrations to progress to leadership roles in nutrition and dietetics; providing a curriculum and opportunities to develop proficiency in research design, conduct, presentation, and interpretation; providing students a broad range of opportunities and experiences for supervised and advanced practice; and overall experience in the Coordinated Master's Program on a scale from excellent to very poor.

Coordinated Master's Program Alumni Survey – Alumni are provided with the link to the survey via the REDCap web-based application about one year post-graduation. Alumni are asked to reflect on their preparedness for employment and quality of educational experience in the Coordinated Master's Program on a scale from excellent to very poor.

The faculty will use these assessment tools to conduct an internal review of the program on a yearly basis. Since graduate information will not be available for the first few years of the program, the informal review will be conducted as a meeting of the involved faculty members.

Expected Standards of Performance

The purpose of the program is to educate students in the multidisciplinary areas of nutrition science and integrative physiology in a manner that emphasizes the mechanistic role of nutrition and integrative physiology in health and disease. Graduates of the doctoral program will have a specific area of expertise in Nutrition and Integrative Physiology. The graduates will become researchers, scholars, teachers, thinkers, and planners in the demanding and changing fields of nutrition and integrative physiology. The graduates will possess the skills necessary to become successful in a career as members of university faculties or other research-related positions.

Learning Outcomes

- Program graduates will demonstrate mastery of concepts in the following areas of nutrition and integrative physiology: macronutrient metabolism, advanced research methods and statistics, scientific writing, and advanced, current laboratory techniques related to physiology as evidence by a successful qualifying exam.
- Program graduates will demonstrate ability to self-educate through literature review and analysis, possess excellent research skills including hypothesis testing and experimental design, and use current technical laboratory skills relevant to clinical or basic research.
- Program graduates will demonstrate effective teaching skills, including development of course content, effective delivery of class material, and design of methods to assess student learning.
- Program graduates will integrate scientific information and research design into their own research and produce three scholarly works for publication.
- Program graduates will demonstrate excellent communication of scientific information using written reports, professional presentations, multimedia approaches, and technical research formats.
- Program graduates will demonstrate collaboration with other scientists as part of multidisciplinary teams.

- Program graduates will demonstrate professional, academic, and scientific ethics.
- Program graduates will demonstrate an ability to self-educate through literature review and analysis, possess excellent research skills including hypothesis testing and experimental design, and use technical laboratory skills relevant to clinical or basic research.
- Program graduates will demonstrate excellence in teaching, including development of course content, effective delivery of class material, and design of methods to assess student learning.

Section V: Finance

Department Budget

Three-Year Budget Projection							
Departmental Data	Current Departmental Budget – Prior to New Program Implementation	Departmental Budget					
		Year 1		Year 2		Year 3	
		Addition to Budget	Total Budget	Addition to Budget	Total Budget	Addition to Budget	Total Budget
Personnel Expense							
Salaries and Wages	1,015,098	160,302	1,175,400	90,000	1,265,400	25,778	1,291,178
Benefits	350,000	53,200	403,200	34,000	437,200	8,744	445,944
Total Personnel Expense	$ 1,365,098	$213,502	$1,578,600	$124,000	$1,702,600	$34,522	$1,737,122
Non-Personnel Expense							
Travel	4,500	2,000	6,500	2,000	8,500	3,000	11,500
Capital	0	0	0	0	0	0	0
Library	0	0	0	0	0	0	0
Current Expense	49,638	1,985	51,623	1,549	53,172	1,595	54,767
Total Non-Personnel Expense	54,138	3,985	58,123	3,549	61,672	4,595	66,267
Total Expense *(Personnel + Current)*	$1,419,236	$217,487	$1,636,783	$127,549	$1,734,272	$39,117	$1,803,389
Departmental Funding							
Appropriated Fund	1,351,626	32,672	1,384,298	38,853	1,423,151	47,865	1,471,016
Other	0	0	0	0	0	0	0
Special Legislative Appropriation	0	0	0	0	0	0	0
Grants and Contracts	135,000	225,000	360,000	75,000	300,000	0	300,000

Special Fees / Differential Tuition	68,475	4,337	72,812	3,805	76,617	3,881	80,498
Total Revenue	$1,555,101	$262,009	$1,817,110	$117,658	$1,799,768	$51,746	$1,851,514
Difference							
Revenue-Expense	135,865	44,522	180,327	(9,891)	65,496	12,629	48,125
Departmental Instructional Cost / Student Credit Hour* *(as reported in institutional Cost Study for "current" and using the same Cost Study Definition for "projected")*	139	19	157	13	170	2	172

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** Projected Instructional Cost/Student Credit Hour data contained in this chart are to be used in the Third-Year Follow-Up Report and Cyclical Reviews required by R411.*

Funding Sources

Additional funding from the University for the credit hours generated by the doctoral program will help to offset the costs associated with creation of the program. Assuming enrollment according to the table "Projected Program Enrollment and Graduates" on page 7, with each student taking 12 credits each per year of courses offered through the Department, the additional funding generated would be approximately $2,820 per student the first year (at a graduate tuition rate of $235/credit hour) for Utah residents. By Year 3, student tuition will contribute $19,740. This is a conservative estimate, and it is anticipated that the additional funding will grow in subsequent years as the program is able to take on additional enrollment. In the budget above, a 2% growth in the other programs of the Department is also assumed and consistent with historic trends. Differential tuition is used in the Coordinated Master's Program, but will not be used for doctoral students.

Funding from grants and contracts is projected to increase significantly as research faculty increases and these funds will be used to support the doctoral program. Incoming faculty are expected to come with research funding or be able to cover their research and salaries within three years. New enrollment of doctoral students will be adjusted annually based on grants and contract funding that is available to support their research projects.

Reallocation

Not applicable

Impact on Existing Budgets

The proposed costs for the doctoral program will be absorbed into the budget of the Department of Nutrition and Integrative Physiology. Funding increases due to increased credit hours will initially offset a portion of the additional costs. The remainder of funds will be generated through grant acquisition.

Section VI: Program Curriculum

The proposed program requires the creation of one new course, NUIP 7850, which is Graduate Seminar. Graduate Seminar responsibilities will be rotated among existing faculty. Other programs in bold are existing courses that require a course prefix change to reflect the new Department name; therefore additional instructors are not required.

Proposed Nutrition and Integrative Physiology PhD curriculum based on entry with MS degree

- Minimum 72 total credits
- Identical/similar courses taken as part of a master's degree program may be transferred into this PhD curriculum upon approval of supervisory committee.
- The program should take 3-5 years for completion.

Emphasis Areas (non-transcripted)

- Integrative Physiology track: 30 credits from major, 6 credits from electives + dissertation hours
- Nutrition track: 30.5 credits from major, 6 credits + dissertation hours

All Program Courses (new Courses in Bold)

Course Prefix and Number	Title	Credit Hours
Required Courses		
NUIP 6440	Macronutrient Metabolism	4
NUIP 7301	Advanced Exercise Physiology Lab I	4
NUIP 7102	Research Methods	3
NUIP 7850	Graduate Seminar (1 credit x 4 semesters)	4
WRTNG 7000	Dissertation Writing	3
FP MD 6100	Biostatistics	3
Sub-Total		21
Emphasis Area in Integrative Physiology or Nutrition		
Integrative Physiology		
NUIP 6380	Muscle Physiology	3
NUIP 6384	Advanced Cardiovascular Physiology	3
NUIP 6381	Pulmonary Physiology and Oxygen Transport	3
Nutrition		
BIO C 6600	Metabolic Regulation	1.5
NUIP 6450	Nutritional Biochemistry	4

NUIP 6460	Micronutrient Metabolism	4
Sub-Total		9/9.5
Elective Courses (choose 6 credits)		
BIOL 5110	Molecular Biology and Genetic Engineering	3
BIOL 5210	Cell Structure and Function	3
BIOL 5215	Cell Biology Advanced Projects Lab	2
BIOL 6964	GSCS Seminar, Special Topics in Ecology and Evolution	1-5
BMI 6010	Foundations of Healthcare Informatics	3
CTLE 6510	Cyber Pedagogy	3
ECON 6190	Health Economics	3
ED PS 6360	Multicultural Counseling	3
ESS 5850-003	The American Professoriate	3
ESS 6320	Exercise and Disease	3
ESS 6730	Applied Sport Psychology	3
ESS 7102	Design and Analysis I	3
ESS 7103	Design and Analysis II	3
FP MD 6106	Categorical Analysis	3
FP MD 6600	Social and Behavioral Context of Public Health	3
GERON 6001	Introduction to Aging	3
HEDU 6060	Health Instruction and Communication	3
HEDU 6260	Health Theories in Group Behavior Change	3
HEDU 6700	Epidemiology in Community Health Practice	3
H GEN 7380	Biochemical Genetics	3
MBIOL 6480	Cell Biology I	1.5
MDCRC 6150	Foundations in Personalized Health Care	3
MKTG 6550	Marketing for Health Professionals	3
NUTR 6020	Body Image and Eating Disorders Special Populations	3
NUTR 6100	Advanced Pediatric and Adolescent Nutrition	4
NUTR 6320	Advanced Sports Nutrition	3
OC TH 6860	Disability Studies Forum	1
SW 6621	Motivational Interviewing	3
WRTG 7080	Writing in the Health Sciences	3
Sub-Total		6
NUIP 7970	Dissertation Research	36
Sub-Total		36
Total Number of Credits		72/72.5

Program Schedule

Nutrition Emphasis

	Year 1	Year 2	Years 3-5
Fall	NUIP 7102: Research Methods NUIP 6440: Macronutrient Metabolism NUIP 7301: Advanced Physiology Lab NUIP 7850: Seminar	NUIP 7970:Dissertation Research Elective NUIP 7850: Seminar NUIP 6460: Nutrition Biochemistry	NUIP 7970: Dissertation Research
Spring	FPMD 6100: Statistics NUIP 7850: Seminar NUIP 6460: Micronutrient Metabolism WRTNG 7000: Dissertation Writing	NUIP: 7970: Dissertation Research NUIP 7850: Seminar Elective BIO C 6600: Metabolic Regulation	NUIP 7970: Dissertation Research

Integrative Physiology Emphasis

	Year 1	Year 2	Years 3-5
Fall	NUIP 7102: Research Methods NUIP 6440: Macronutrient Metabolism NUIP 7301: Advanced Physiology Lab NUIP 7850: Seminar	NUIP 7970: Dissertation Research Elective NUIP 7850: Seminar NUIP 6381: Pulmonary Physiology	NUIP 7970: Dissertation Research
Spring	FPMD 6100: Statistics NUIP 7850: Seminar NUIP 6384: Cardiovascular Physiology WRTNG 7000: Dissertation Writing	NUIP 7970: Dissertation Research NUIP 7850: Seminar (1) NUIP 6380: Muscle Physiology(1.5)	NUIP 7970: Dissertation Research

Section VII: Faculty

Department of Nutrition and Integrative Physiology Faculty

- Sydney Abbott, MS, RD, Associate Instructor
- Wayne Askew, PhD, Professor Emeritus
- Kathie Beals, PhD, RD, CSSD, Associate Professor (Lecturer)
- Joan Benson, MS, RD, Assistant Professor (Lecturer)
- Theresa Dvorak, MS, RD, Assistant Professor (Lecturer)
- Patricia Guenther, PhD, RD, Research Professor
- Thunder Jalili, PhD, Associate Professor
- Kris Jordan, PhD, RD, Associate Professor
- Shannon Jones, MS, Associate Instructor

- Tahmina Martelly, BS, RD, Associate Instructor
- Jim Martin, PhD, Associate Professor
- Staci McIntosh, MS, RD, Associate Professor (Lecturer)
- Julie Metos, PhD, RD, Department Chair, Assistant Professor
- Anandh Pon Velayutham, PhD, Assistant Professor
- Russell Richardson, PhD, Professor
- Allison Riederer, MS, RD Associate Instructor
- John David Symons, PhD, Professor
- Andrea White, PhD, Associate Research Professor
- Stacie Wing-Gaia, PhD, RD, Associate Professor (Clinical)
- Kary Woodruff, MS,RD, Clinical Instructor
- Jean Zancanella, MS, Assistant Professor (Clinical)

Faculty Line (to be hired) – Chair and Professor
Faculty Line (to be hired) – Assistant or Associate Professor

Adjunct Faculty

• Ted Adams, PhD, MPH, Adjunct Associate Professor	Cardiovascular Genetics
• Markus Amann, Adjunct Assistant Professor	Geriatrics
• John Bridge, Adjunct Professor	Internal Medicine
• Nicholas Brown, Adjunct Assistant Professor	Exercise and Sport Science
• Gary Chan, MD, Adjunct Professor	Pediatrics
• Nathalie Chevreau, PhD, RD, Adjunct Instructor	Industry Research and Development
• Leland Dibble, Adjunct Associate Professor	Physical Therapy
• Anthony Donato, Adjunct Assistant Professor	Exercise and Sport Science
• Micah Drummond, PhD, Adjunct Associate Professor	Physical Therapy
• Patricia Eisenman, PhD, Adjunct Professor	Exercise and Sport Science
• Constance Geiger, PhD, RD, Adjunct Associate Professor	Consultant
• Timothy Graham, MD, Adjunct Associate Professor	Diabetes and Metabolism
• Caran Graves, MS, RD, CD, Clinical Instructor	Nutrition Care Services
• Christopher Hill, Adjunct Associate Professor	Office of the President
• William Daniel Jackson, MD, Adjunct Professor	Pediatrics
• Lisa Joss-Moore, PhD, Associate Professor	Pediatrics
• Paul Lastayo, Adjunct Professor	Physical Therapy
• Lisa Lesniewski, Adjunct Assistant Professor	Internal Medicine – Geriatrics
• Robin Marcus, Adjunct Associate Professor	Physical Therapy
• Suzanne Parker-Simmons, MS, RD	US Ski and Snowboard Association
• Maureen Murtaugh, PhD, RD, Adjunct Associate Professor	Internal Medicine
• Susan Saffel-Shrier, MS, RD, CD, Adjunct Associate Professor	Family and Preventive Medicine
• Janet Shaw, PhD, Adjunct Associate Professor	Exercise and Sport Science

• James Walker, Adjunct Assistant Professor	The Orthopedic Specialty Hospital
• Beth Wolfgram, MS, RD, CD, Adjunct Instructor	University Athletics
• Steven Wood, PhD, Adjunct Associate Professor	Industry Research and Development

Additional Collaborators

• Sihem Boudina, PhD	Diabetes and Metabolism
• Tim Brusseau, PhD, Assistant Professor	Exercise and Sport Science
• Lauren Clark, RN, PhD, Associate Professor	College of Nursing
• Alexandria Fuller, Visiting Instructor	Exercise and Sport Science
• John Hurdle, MD, PhD, Professor	Biomedical Informatics
• Gwenael Layec, PhD	Internal Medicine – Geriatrics
• Nicole Mihalopoulos, MD, Associate Professor	Pediatrics
• Nicole Miller, Visiting Assistant Professor	Exercise and Sport Science
• Mark Supiano, MD	Internal Medicine
• Traci Thompson, Instructor	Exercise and Sport Science
• Joel Trinity, PhD	Internal Medicine
• Rebecca Utz, PhD, Associate Professor	Sociology
• James VanDerslice, PhD, Research Associate Professor	Public Health
• David Wray, PhD	Internal Medicine – Geriatric

References

1. United States Department of Labor, Bureau of Labor Statistics. Retrieved September 25, 2015 from http://www.bls.gov/ooh/.
2. Leroy, L., Bayliss, E., Domino, M., Miller, B.F., Rust, G., Gerteis, J., Miller, T. (2014) *The Agency for Healthcare Research and Quality Multiple Chronic Conditions Research Network: Overview of research contributions and future priorities*. *52(3)*, 15-22.
3. O'Sullivan, Maillet, J., Brody, R.A., Skipper, A., Pavlinac, J.M. (2012). Framework for analyzing supply and demand for specialist and advanced practice registered dietitians. *Journal of the Academy of Nutrition and Dietetics, 112(3)*, 47-55.
4. Rhea, M., Bettles, C., (2012) Four futures for dietetics workforce supply and demand: 2012-2022 scenarios. *Journal of the Academy of Nutrition and Dietetics, 112(3),* 25-34.
5. Utah Workforce Services Labor Market. Retrieved September 23, 2015 from http://jobs.utah.gov/wi/index.html.
6. Ward, B. (2012) Compensation and benefits survey 2011: moderate growth in registered dietitian and dietetic technician, registered, compensation in the past 2 years. *Journal of the Academy of Nutrition and Dietetics, 112(1),* 29-40.