

## Cover/Signature Page – Full Template

**Institution Submitting Request:** University of Utah

**Proposed Title:** Doctor of Philosophy in Nutrition and Integrative Physiology

**School or Division or Location:** College of Health

**Department(s) or Area(s) Location:** Department of Nutrition and Integrative Physiology

**Recommended Classification of Instructional Programs (CIP) Code<sup>1</sup> :** 26.0102

**Proposed Beginning Date:** Fall 2016

**Institutional Board of Trustees' Approval Date:**

**Proposal Type (check all that apply):**

Regents' Agenda Items		
<i>R401-4 and R401-5 Approval by Committee of the Whole</i>		
SECTION NO.		ITEM
4.1.1	<input type="checkbox"/>	(AAS) Associate of Applied Science Degree
4.1.2	<input type="checkbox"/>	(AA) Associate of Arts Degree
	<input type="checkbox"/>	(AS) Associate of Science Degree
4.1.3	<input type="checkbox"/>	Specialized Associate Degree
4.1.4	<input type="checkbox"/>	Baccalaureate Degree
4.1.5	<input type="checkbox"/>	K-12 School Personnel Programs
4.1.6	<input type="checkbox"/>	Master's Degree
4.1.7	<input checked="" type="checkbox"/>	Doctoral Degree
5.2.2	<input type="checkbox"/>	(CER C) Certificate of Completion
5.2.4	<input type="checkbox"/>	Fast Tracked Certificate

**Chief Academic Officer (or Designee) Signature:**

I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

\_\_\_\_\_  
Signature

Date: *MM/DD/YEAR*

Printed Name: *Ruth Watkins, Senior Vice President*

<sup>1</sup> CIP codes must be recommended by the submitting institution. For CIP code classifications, please see <http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55>.

**Executive Summary – Full Template**  
**University of Utah**  
**Doctor of Philosophy in Nutrition and Integrative Physiology**  
**10/02/2015**

**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 awards a PhD degree focusing on preparing individuals with the expertise needed to conduct independent research and obtain positions as faculty members in academic institutions and industry.

**Role and Mission Fit**

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, both of these statements reflect the University's 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.

**Faculty**

Faculty members in the department have extensive experience working with doctoral students, as primary mentors or as supervisory committee members in other departments. Faculty members joining the newly designated Department from the former Department of Exercise and Sport Science have served as chairs of approximately fourteen doctoral committees. Those joining the Department from the previous Division of Nutrition have served as doctoral committee members at other universities or programs such as Bioinformatics and Exercise and Sport Science. Currently, a search is in progress for Chairperson for the newly created Department of Nutrition and Integrative Physiology and, following that hire, another faculty line is expected to be filled, providing additional capacity for PhD program leadership.

**Market Demand**

By 2022, the Utah Department of Workforce Services projects there will be a 3.2% increase in the number of Healthcare Practitioners; a 2.8% increase in Education positions; and a 2.3% increase in Life, Physical and Social Scientists. According to the Bureau of Labor Statistics, 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. Additionally, the Bureau states that employment of medical scientists is projected to increase 13% from 2012 to 2022. The role of food, nutrition, and exercise in preventing and treating illnesses, such as diabetes, is now well known. Other factors affecting the demand for nutrition and integrative physiologists include the aging population, health care reform, increased employment opportunities in the food and fitness industries, and increased need for research to advance the field. To meet the Governor's call that 66% of Utahns will have a post-secondary degree or certificate, Utah will need to have additional faculty members in higher education who 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 include biomedical sciences such as nutrition and integrative physiology. Doctoral-trained faculty members are needed to meet the demands of the growing number of students interested in academic careers or those interested in industry research who will provide cutting-edge research and development skills to Utah employers.

**Student Demand**

Department exit surveys 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. 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.

**Statement of Financial Support**

Appropriated Fund.....	X
Special Legislative Appropriation.....	<input type="checkbox"/>
Grants and Contracts.....	X
Special Fees .....	<input type="checkbox"/>
Differential Tuition (must be approved by the Regents).....	<input type="checkbox"/>
Other (please describe).....	<input type="checkbox"/>

**Similar Programs Already Offered in the USHE**

Nutrition, Dietetics, Food Science PhD Program, Utah State University  
PhD in Pathokinesiology within the doctoral program in Disability Disciplines, Utah State University

**Program Description – Full Template**  
**University of Utah**  
**Doctor of Philosophy in Nutrition and Integrative Physiology**  
**10/02/2015**

**Section I: The Request**

University of Utah requests approval to offer a Doctor of Philosophy in Nutrition and Integrative Physiology effective Fall 2016. This request supports the realignment of the College of Health approved July 2015.

**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) have encouraged formation of a doctoral program once the Department has 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 express 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 brings together faculty from Nutrition and Exercise and Sport Science to form the Department of Nutrition and Integrative Physiology (NUIP). The new Department will have 9 tenure-line faculty members actively engaged in ongoing research agendas 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, the College of Nursing, and the Veteran's 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 Veteran's Administration Medical Center.

A work group of tenure-line and career-line faculty members have 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 e-mail following review at the 9/28/2015 faculty meeting. On October 2, 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
<b>With Doctoral Degrees</b> (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
<b>With Master's Degrees</b>			
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
<b>With Bachelor's Degrees</b>			
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
<b>Other</b>			
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
<b>Total Headcount Faculty in the Department</b>			
Full-time Tenured	6	0	7
Full-time Non-Tenured	11	0	11

Part-time Tenured	0	0	0
Part-time Non-Tenured	8	0	8
<b>Total Department Faculty FTE</b> <i>(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.")</i>	25	2	27

### Faculty

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 Chairperson with an independent line of research. This individual will have at least one line to fill, bringing the total department faculty FTE to 22.

### 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 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. The existing resources of the Eccles Health Sciences library are adequate for support of this doctoral program.

### 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 table below summarizes a number of integrated physiology/nutrition/bioscience programs around the United States. We selected well-known programs at Universities that are historically strong in Nutrition science and/or Integrative Physiology and represent examples from sister institutions at PAC-12, BIG-10, and similar schools.

Institution	Program	Number of Credits & program notes	Administrating Department
Utah State University	Nutrition, Dietetics, Food Science PhD Program	70 credits required 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 credit hours beyond MS; 12 dissertation hours	School of Applied Physiology
Purdue University	Interdepartmental Nutrition PhD Program	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 credit hours beyond BS degree. 30 dissertation hours.	Department of Kinesiology

The Ohio State University	Interdisciplinary PhD Program in Nutrition	80 credits beyond BS degree. MS credits may count for 30 of the 80 hours. 32-41 credits from coursework, balance from research credits.	Colleges of Education & Human Ecology; Agricultural & Environmental Sciences; Medicine; Veterinary Medicine.
Oregon State University	PhD in Nutrition	108 credits beyond BS degree. 36 minimum credits from research.	School of Biological and Population Health Sciences
University of Oregon	Human Physiology PhD	135 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 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	90 credits beyond BS degree, 60 credits beyond MS degree.	Center for Nutritional Sciences
	Exercise Physiology PhD	Minimum 22 credits from coursework, balance of credits from research.	Department of Applied Physiology and 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
University of South Carolina	Exercise Science PhD	30 hours beyond Master's.	Department of Exercise Science
University of Texas	PhD in Nutritional Sciences	60 credits minimum beyond BS degree. 24 credits coursework, balance from research credits.	Department of Nutritional Sciences
	Kinesiology PhD	48 credits beyond Master's including 18 dissertation hours	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 (see Appendix for letters of support).

### 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
<b>Data for Proposed Program</b>						
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
<b>Departmental Data – For All Programs Within the Department</b>						
Total Department Faculty FTE ( <i>as reported in Faculty table above</i> )	25	25	27	27	27	27
Total Department Student FTE ( <i>Based on Fall Third Week</i> )	285*	287**	291**	298**	307**	317**
Student FTE per Faculty FTE ( <i>ratio of Total Department Faculty FTE and Total Department Student FTE above</i> )	11.4	11.5	10.8	11.0	11.4	11.7
Program accreditation-required ratio of Student FTE/Faculty FTE, if applicable: (Provide ratio here: _____)	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 Master's 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 9 tenure track faculty in the newly formed Department to mentor PhD students. Therefore, we are proposing to offer doctoral study in Nutrition and Integrative Physiology 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 a registered dietitians and those interested in industry research who will provide cutting-edge research and development skills to Utah employers.

### **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 UHSE system to the University of Utah. Furthermore, this doctoral program will encourage greater collaboration between the Diabetes, Metabolism and Obesity Research Center and our Department, resulting in excellent interdisciplinary learning opportunities for graduate students. It enhances the ability of our 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 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.

1. 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.

2. 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**

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. The ability of the doctoral program to achieve these goals will be assessed from the program assessment procedures described above. The acquisition of these skills by an individual student will be assessed by the student's supervisory committee who will oversee the student's completion of the following requirements for graduation:

1. Successful completion of a minimum of 72 credit hours, comprised of 21 credits from the core curriculum, 9 credits in the student's area of emphasis, 6 additional credits of electives, and 36 credits of doctoral dissertation research.
2. Successful completion of a Qualifying Examination, demonstrating competency in the domains of research and statistics and the student's area of emphasis in nutrition and integrative physiology. The Qualifying Examination will be evaluated by the student's supervisory committee to ensure that the student is adequately prepared to accomplish his or her dissertation research.
3. Submission of a written dissertation and successful completion of the oral defense of that dissertation. The written and oral defense of the dissertation will be evaluated by the student's supervisory committee to ensure that the student possesses the skills necessary to conduct, present, and defend his or her research. After final approval of the dissertation by the supervisory committee, the student will have completed all requirements of the doctoral program.

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
<b>Personnel Expense</b>							
Salaries and Wages	1,015,098	160,302	1,175,400	90,000	1,288,908	25,778	1,314,686
Benefits	350,000	53,200	403,200	34,000	437,200	8,744	445,944
<b>Total Personnel Expense</b>	<b>\$ 1,365,098</b>	<b>\$213,502</b>	<b>\$1,578,600</b>	<b>\$124,000</b>	<b>\$1,726,108</b>	<b>\$34,522</b>	<b>\$1,760,630</b>
<b>Non-Personnel Expense</b>							
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	54,136	3,985	58,123	3,549	61,672	4,595	66,267
<b>Total Expense (Personnel + Current)</b>	<b>\$1,419,236</b>	<b>\$217,487</b>	<b>\$1,636,723</b>	<b>\$127,549</b>	<b>\$1,787,780</b>	<b>\$39,117</b>	<b>\$1,826,897</b>
<b>Departmental Funding</b>							
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	225,000	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
<b>Total Revenue</b>	<b>\$ 1,555,101</b>	<b>\$262,009</b>	<b>\$1,817,110</b>	<b>\$117,658</b>	<b>\$1,934,768</b>	<b>\$51,746</b>	<b>\$1,986,514</b>

Difference							
Revenue-Expense	135,865	44,516	44,522	(9,891)	11,988	12,629	24,617
Departmental Instructional Cost / Student Credit Hour* <i>(as reported in institutional Cost Study for "current" and using the same Cost Study Definition for "projected")</i>	\$ 139	\$ 19	\$157	\$13	\$170	\$2	\$172

\* *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 3, 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 from 4 to 9 faculty members and will be used to support the doctoral program. 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

### All Program Courses (with New Courses in Bold)

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 Integrated Physiology Ph.D. Curriculum based on entry with M.S. 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

- 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 (with New Courses in Bold)

Course Prefix and Number	Title	Credit Hours
<u>Required Courses</u>		
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
<b>Sub-Total</b>		<b>21</b>
Emphasis Area–Either Integrated Phys or Nutrition		
<u>Integrated Phys Emphasis</u>		
NUIP 6380	Muscle Physiology	3
NUIP6384	Advanced Cardiovascular Physiology	3
NUIP6381	Pulmonary Physiology and Oxygen Transport	3
<u>Nutrition Emphasis</u>		
BIO C 6600	Metabolic Regulation	1.5
NUIP 6450	Nutritional Biochemistry	4
NUIP 6460	Micronutrient Metabolism	4
<b>Sub-Total</b>		<b>9/9.5</b>
<u>Elective Courses (choose 6 credits)</u>		
BIOL 5110	Molecular Biology and Genetic Engineering	3
BIOL 5210	Cell Structure and Function	3
BIOL 5215	Cell Biology Advanced Projects Lab	2



Course Prefix and Number	Title	Credit Hours
BIOL 6964	GSCS Seminar, Special Topics in Ecology and Evolution Biology	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 7103	Design and Analysis II	3
ESS 7102	Design and Analysis I	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
<b>Sub-Total</b>		<b>6</b>
<b>NUIP 7970</b>	<b>Dissertation Research</b>	<b>36</b>
<b>Sub-Total</b>		<b>36</b>
<b>Total Number of Credits</b>		<b>72/72.5</b>

### Core NUIP Curriculum (21 credits)

NUIP 6301 Advanced Exercise physiology lab (lab methods practicum) – (3 credits)

*In this course you will develop skills for utilizing the scientific method. Dependent variables for experiments in this course require developing laboratory skills related to indirect calorimetry, metabolic measures of exercise efficiency and recovery, carbohydrate, lactate, and lipid metabolism, body composition appraisal, muscle-power tests, and bone health.*

NUIP 7850 Graduate Seminar – (1 x 4 semesters-4 credits total)

*This course serves the purpose of a) a forum for presenting theses and dissertations, b) providing information on professional development and conduct.*

NUIP 6440 Macronutrient Metabolism – (4 credits)

*Metabolism of carbohydrates, fats, proteins, and other related topics with emphasis on the regulation of energy metabolism and the inter-relationships of the biochemistry and nutrition of macronutrients and chronic disease.*

NUIP 7102 Research Methods – (3 credits)

*A survey of common research methods in health-related disciplines with a focus on the practical application of these research methods for graduate student research projects.*

WRTNG 7000 Dissertation writing – (3 credits)

*Introduces students to the various genres of dissertations and how to prepare them. The course focuses on the process of writing a dissertation, from contextualizing a research problem, to describing research methods, to making the results relevant to a scholarly community.*

FPMD 6100 Biostatistics – (3 credits)

*Basic course in the use of biostatistical methods in the analysis of health and medical data.*

#### Integrated Physiology Emphasis Curriculum (9 credits)

NUIP 6380 Muscle Physiology – (3 credits)

*Consider advanced topics relative to muscle function and assessment including inter-relationships between metabolism and physical performance.*

NUIP 6384 Advanced Cardiovascular Physiology – (3 credits)

*The student will gain an in-depth understanding of how the cardiovascular system responds to acute exercise. Students will also consider potential interaction between long term adaptations to exercise and the cardiovascular disease processes.*

NUIP 6381 Pulmonary Physiology and Oxygen Transport – (3 credits)

*This course will provide students with an in-depth understanding of the complex structure and function of the lungs and the mechanisms responsible for gas transport and exchange in the periphery. Specifically, the mechanisms responsible for pulmonary function, gas transport, and the control of ventilation at rest and during exercise in health and disease will be integrated both in the classroom and in the laboratory.*

#### Nutrition Emphasis Curriculum (9.5 credits)

BIO C 6600 Metabolic Regulation – (1.5 credits)

*This half-semester course will begin with a review of carbohydrate and lipid metabolic pathways, with an emphasis on an integrated understanding the pathways and what is known about their regulation. The course will progress to an in-depth analysis of current research in specific areas of nutritional sensing and metabolic regulation.*

NUIP 6450 Nutritional Biochemistry – (4 credits)

*This course is designed to give students a thorough working knowledge of cellular biochemistry and genetics as it pertains to human physiology, nutrition and metabolism. Background material will be supplemented and reinforced through study of relevant systems and disease states.*

NUIP 6460 Micronutrient Metabolism – (4 credits)

*Biochemical and physiological role of vitamins, minerals, and trace elements in maintenance of homeostasis in humans. Nutrient deficiency and toxicity syndrome, and application of inborn errors of metabolism are discussed as case studies.*

Electives –minimum 6 credits. Examples are:

BIOL 5110 Molecular Biology and Genetic Engineering – (3 credits)

*Recombinant-DNA principles and techniques; background biology. Basic enzymology of DNA (restriction and modification, sealing, reverse transcription, nick translation, end labeling, etc.), cloning plasmids and their replication, bacteriophage, and basic methodologies.*

BIOL 5210 Cell Structure and Function – (3 credits)

*Relations between structure and function in animal cells. Membranes and permeability, structural components and motility, cell division, and hormone receptors and functions. Reading from current research literature.*

BIOL 6964 GSCS Seminar, Special Topics in Ecology and Evolution Biology – (1 - 5 credits)

*Topics of special interest taught when justified by student and faculty interest. Content varies from year to year.*

BMI 6010 Foundations of Healthcare Informatics – (3 credits)

*An overview of basic concepts in medical and healthcare informatics. These core concepts include an introduction to the foundational theory and practical application of clinical decision making; computerized decision support; healthcare systems and their organization; the special issues of administration, security, and operations of electronic records in the healthcare setting; human factors issues; information science in the biomedical domain; imaging informatics; tele-health technology; public health informatics; standards, terminologies, and the uniqueness of biomedical data; and a special focus on emerging technologies.*

CTLE 6510 Cyber Pedagogy – (3 credits)

*Online teaching requires a different way of thinking about educational objectives; relationships with and between students; content organization and presentation; and, the interface between teacher, student and technology. This course introduces instructional technology paradigms by exploring principles of online learning; offering examples of instructional technology best practices; and, providing participants the opportunity to experiment with designing their own online strategies, techniques and approaches.*

ECON 6190 Health Economics – (3 credits)

*Economics of health care, health-care delivery systems, public and private health insurance, location of health facilities, and health-care inflation.*

ED PS 6360 Multicultural Counseling – (3 credits)

*A course in diversity issues which examines counseling the culturally different client. The course is grounded in an awareness, knowledge, and skills approach. Ethnic/cultural groups, women, sexual orientation, and disability will be examined. This is both an experimental and seminar-based course.*

ESS 5850-003 Special Topics - The American Professoriate

*This class is designed to assist doctoral students in understand the world of academia including how to write a curriculum vitae, ethics in research and publication, interviewing and obtaining an academic appointment.*

ESS 6320 – Exercise and Disease – (3 credits)

*This class will consider the inter-relationship between disease pathology and exercise participation*

ESS 6390 – Biomechanics – (3 credits)

*The purpose of this course is to teach students to evaluate muscular function during voluntary activities. Students will learn the computational techniques for performing inverse dynamics to determine net joint moments and muscular forces. This technique will then be used to analyze human movement in a range of sport and pathological applications*

ESS 6730 Applied Sport Psychology – (3 credits)

*Knowledge and skills to develop performance- enhancement programs for athletes and athletic teams. Motivation, learning, leadership, communication, problem-solving strategies, and group dynamics are also discussed and applied.*

ESS 7830 Journal Readings – (1-3 credits)

*To provide students with opportunities to critically evaluate the research literature for the purpose of formulating and developing their own research questions.*

FPMD 6106 Categorical Analysis – (3 credits)

*Biostatistics for categorical response data including statistical inference for proportions, contingency table, generalized linear models and related regression techniques, loglinear models, ordinal and multcategory logit models, paired and clustered categorical data, generalized linear mixed models.*

FPMD 6600 Social and Behavioral Context of Public Health – (3 credits)

*The course will consider disease and illness within socio-cultural contexts. Emphasis will be placed on the ethical, behavioral, social, cultural, political and economic factors that influence the prevention/treatment of medical and public health problems.*

GERON 6001 Introduction to Aging – (3 credits)

*Overview of gerontology presented by examining the major issues, problems, and solutions related to an aging society, research methodology, theories of aging, and future implications at local, national and international levels. The value of interdisciplinary and life course perspectives are emphasized.*

HEDU 6060 Health Instruction and Communication – (3 credits)

*The course will explore the theories and methods of health educating and health promoting in schools, clinical settings, businesses, and the community. The course will explore related educational theories as they apply to health teaching and coaching. The course will explore the crafting and delivery of messages and strategies, based upon consumer research, to promote the health of individuals and communities.*

HEDU 6260 Health Theories in Group Behavior Change – (3 credits)

*This course is designed as an introduction to the application of psychological theory and techniques of group behavior change. The purpose is to teach facilitators how to use group techniques to help people change specific health-related behaviors.*

HEDU 6700 Epidemiology in Community Health Practice – (3 credits)

*An introductory course to study the scope of epidemiology, its practical application to public health via the examination of the distribution and determinants of chronic and communicable diseases as well as the determinants of environmental, behavioral, and social issues. Emphasis will be placed on the uses of epidemiology in community health settings.*

H GEN 7380 – Biochemical Genetics – (3 credits)

*Includes inborn errors of metabolism and several common disorders, such as diabetes and hypertension, which have biochemical bases correctable by diet or other medical intervention. Provides overview of biochemical pathways, practical experience on how the biochemical pathways can be studied in vivo and in vitro, the molecular bases of common metabolic problems, the mechanism of inheritance including recurrence risk, and how to rationally treat metabolic blocks.*

MBIOL 6440 Gene Expression – (1.5 credits)

*This course covers both transcriptional and post-transcriptional mechanisms of gene regulation. Lectures cover recent advances in these fields with material based on the primary literature. The transcriptional regulation section covers, basic mechanisms of gene activation and repression, chromatin remodeling machines, regulation of transcription activation by signal transduction cascades. The post-transcriptional section covers mechanisms regulating RNA processing (splicing, editing, and transport), translation and mRNA stability.*

MBIOL 6480 Cell Biology – (1.5 credits)

*This course covers basic and advanced topics related to cell structure and function including cytoskeleton, membrane trafficking, protein targeting/modification and degradation, cell cycle regulation, and signal transduction.*

MDCRC 6150 Foundations in Personalized Health Care – (3 credits)

*This course will review the fundamental elements of Personalized Health Care, discuss relevant case studies of preventive and therapeutic applications of Personalized Health Care, and explore future developments. Students will also have the opportunity to devise ways in which Personalized Health Care can be advanced locally, nationally, and globally.*

MKTG 6550 Marketing for Health Professionals – (3 credits)

*Designed to introduce students to the unique nature of marketing in the healthcare sector. Marketing theory and methods are applied to health services, programs and medical practice. Special needs and difficult challenges in healthcare marketing are discussed and the needs and perspectives of the multiple stakeholders involved in healthcare are considered. Issues relevant to effective program design, distribution, pricing and promotion are studied with emphasis on marketing research and its role in improving these activities.*

NUTR 6020 Body Image and Eating Disorders Special Populations – (3 credits)

*Promoting healthy behaviors for diverse individuals and breaking stereotypes about eating disorders will be the primary goals of the course. Assessment, treatment and prevention strategies for working with these populations will be discussed.*

NUTR 6100 Advanced Pediatric and Adolescent Nutrition – (4 credits)

*This class will examine nutrition needs of healthy infants, children, and adolescents as well as medical nutrition therapy for selected pediatric diseases and chronic illnesses. Special emphasis will be placed on growth and development, pediatric nutrition assessment, and the effect of the environment on the nutritional intake of children and adolescents.*

NUTR 6320 Advanced Sports Nutrition – (3 credits)

*Course designed for graduate students to explore the relationships of the biochemistry and physiology of metabolism as they relate to nutrition and exercise performance. This course is designed to complement the American Dietetic Association Board Certification in Sports Dietetics.*

NUTR 6650 Eating for Justice, Health, and Sustainability – (3 credits)

*In this course, students will explore political and economic factors that affect a just and sustainable food system, consider how our food choices promote or discourage justice and sustainability, and navigate the ways that our food cultivation, preparation, and consumption is related to healthy lifestyles. And there will be cooking, canning, and field trips to local farms and restaurants.*

OC TH 6860 Disability Studies Forum – (1 credits)

*The Disability Studies Forum is intended to: 1) Provide members of the University of Utah Disability Studies community with the opportunity to interact with national and international Disability Studies scholars, 2) Provide a forum to share research results and ongoing research being conducted in the area of disability studies by faculty and students, and 3) Increase awareness of students, faculty and community members about the Graduate Certificate in Disability Studies and the existence of Disability Studies and existence of Disability Studies at the University of Utah.*

SW 6621 Motivational Interviewing/Variable Topics – (3 credits)

*Focused area of study electives (FAS) are chosen from in-house or interdisciplinary offerings to complement a student's focused study: a field of practice; a social problem area; populations at-risk; intervention method or roles; or social work practice context and perspectives.*

WRTG 7080 Writing in the Health Sciences – (3)

*Designed to help graduate students in health science fields develop the writing skills necessary for scientific research and professional communication in their disciplines. Students learn strategies for preparing various forms and styles of scientific writing, including research proposals, reports, literature reviews, and presentation posters and slides. Students learn how to plan and organize a persuasive scientific argument, use graphics effectively to support claims, integrate and document secondary research, and revise their prose to develop a clear and concise writing style.*

Dissertation Research (36 credits)

NUTR 7970 Dissertation research

*Student writes dissertation proposal, conducts dissertation research, writes doctoral thesis, and takes final examination while registered for this course.*

**Program Schedule**

	YEAR ONE	YEAR TWO	YEARS 3-5
FALL	Research Methods (3) Macronutrient Metabolism (4) Advanced Physiology Lab (4) Seminar (1)	Dissertation Hours (4) Elective (3) Seminar (1) Nutrition Biochemistry (NUTR emphasis) (3) OR Pulmonary Physiology (PHYS emphasis) (3)	Dissertation Hours (9-12) Elective (3)
SPRING	Statistics (3) Seminar (1) Micronutrient Metabolism (NUTR emphasis) (4) OR Cardiovascular Physiology (PHYS emphasis) (3)	Dissertation Hours (8) Seminar (1) Muscle Physiology (PHYS emphasis) (3) OR Metabolic Regulation (NUTR emphasis) (1.5)	Dissertation Hours (12-15)

**Core classes:** 21 credit hours  
**NUTR or PHYS Emphasis:** 9-9.5 credit hours  
**Elective classes:** 6 credit hours  
**Dissertation Hours** 36 credit hours  
  
**PROGRAM TOTAL:** 72-72.5 credit hours

## Section VII: Faculty

### Department of Nutrition and Integrative Physiology Faculty

Sydney Abbott, MS, RD Associate Instructor  
E. Wayne Askew, PhD, Professor Emeritus  
Kathie Beals, PhD, RD, CSSD, Associate Professor (Lecturer)  
Joan Benson, MS, RD Asst. Professor (Lecturer)  
Theresa Dvorak, MS, RD Asst. 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 Wolfram, 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 - Geriatrics

### 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, Mailliet, 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.



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801.581.4080; 801.581.4297 (fax) [www.medicine.utah.edu/BMI](http://www.medicine.utah.edu/BMI)

John F. Hurdle, MD, PhD  
Professor and Director,  
Graduate Studies

September 27, 2015

Julie Metos, PhD, RD  
Chairperson, Division of Nutrition  
College of Health  
University of Utah  
Salt Lake City, UT 84112

Dear Julie,

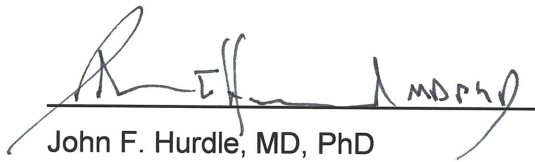
It has been a great pleasure working with you and your colleagues in Nutrition. As you know, in addition to co-mentoring and publishing with you and your students, I have worked extensively with Drs. Jordan and Guenther on several projects at the intersection of nutrition and biomedical informatics. I also have enjoyed serving on several Masters committees in your Division. So when I heard that you were creating a proposal to justify a new doctorate degree in Nutrition and Integrative Physiology, I immediately saw the possibilities for even greater multidisciplinary work between our departments. The fact that you included our flagship informatics introductory course, BMI 6700, Foundations of Healthcare Informatics, in the proposed elective curriculum underscores that potential.

With the creation of your new department, plus the addition of this new doctoral degree, we would have the basis for a very strong T32 training grant proposal. Here in the Department of Biomedical Informatics, I am the principal investigator of our T32-equivalent training grant (T15-LM007124), a program that has been successfully training both pre-and post-doctoral graduate students for nearly 20 years. We have several faculty, including myself, who would be logical choices to include as mentoring faculty on a new T32 based in your department. The merging of nutrition and informatics would be, to the best of my knowledge, a completely unique focus in the U.S. for a training program. And it would be made possible by your doctoral degree offering.

It is my hope that the nutrition informatics research we are conducting with Drs. Jordan and Guenther would attract some of your new doctoral students. I can promise you that they would be well received in our Department. In fact, from my perspective new doctoral students from your program will be essential for continuing a vital multidisciplinary collaboration. Informatics graduate students approach nutrition informatics as computer scientists, and I readily admit that our understanding of nutrition and physiology is often wanting. Students from your doctoral degree program would provide balance and would inject a welcome, new perspective in this nascent discipline of nutrition informatics.

Your program has a solid basis for a doctoral degree. I enthusiastically endorse this new offering of yours in Nutrition and Integrative Physiology. I look forward to strengthening our multidisciplinary approach to nutrition and informatics, and I would reiterate that it is an absolutely unique combination nationally.

Best of luck with your proposal,

A handwritten signature in black ink, appearing to read "John F. Hurdle MD PhD", written over a horizontal line. The signature is cursive and somewhat stylized.

John F. Hurdle, MD, PhD



COMMUNICATION SCIENCES  
AND DISORDERS

EXERCISE AND  
SPORT SCIENCE

HEALTH PROMOTION  
AND EDUCATION

NUTRITION

OCCUPATIONAL THERAPY

PARKS, RECREATION  
AND TOURISM

PHYSICAL THERAPY

September 21, 2015

To Whom It May Concern:

With this letter I convey my full endorsement for the proposed Doctoral Program in Nutrition and Integrative Physiology in the College of Health at the University of Utah. A primary purpose of the recent realignment of the College of Health from 7 departments and divisions to 5 departments was the creation of a department – the Department of Nutrition and Integrative Physiology (NUIP) – to prepare scholars in these fields of study.

The creation of a PhD in Nutrition and Integrative Physiology is consistent with the College of Health and University of Utah's mission to improve the health of citizens of Utah and beyond. It has been recommended by both internal and external review teams during the past two Graduate Council reviews. It will also strengthen and support important collaborations with the College of Health and Health Sciences, including the Diabetes and Metabolism Center (DMC), Department of Internal Medicine, and Division of Endocrinology, among other areas.

I envision the realignment of the College of Health and an accompanying modification in the manner by which faculty lines are allocated to the departments of the College resulting in additional resources for the Department of Nutrition and Integrative Physiology. In fact, we are currently conducting a national search for a Chair of NUIP and are partnering with the DMC to recruit an established scholar to the College of Health with expertise in diabetes and either exercise or nutrition. The Department of Nutrition and Integrative Physiology will be the home for this new scholar.

The labor market demand within Utah and across the country is sufficient to justify creation of a new PhD in Nutrition and Integrative Physiology. One doctoral program currently exists in the USHE system (Utah State University) and the missions of this and the proposed program are sufficiently different that they will be complimentary rather than competitive.

I would be pleased to provide any additional information or justification in support of the proposed Doctoral Program in Nutrition and Integrative Physiology. Thank you for your consideration of this important academic program proposal.

Sincerely,

David H. Perrin, PhD  
Dean and Professor



Diabetes and Metabolism Center

September 22, 2015

Julie Metos, PhD, RD  
Chairperson, Division of Nutrition  
250 S 1850 E  
Salt Lake City, UT 84112

Dear Dr. Metos,

On behalf of the University of Utah Diabetes and Metabolism Center (DMC), I enthusiastically support your pursuit of a PhD Program in Nutrition and Integrative Physiology and recommend this application to the Graduate Council.

The University of Utah DMC aims to unify clinicians, researchers, and educators to prevent, treat, and eradicate diabetes in our nation as well as to enhance our understanding of the impact of metabolism and metabolic disorders in other diseases. As one of the UUHS strategic research initiatives, the DMC is partnering across campus to elevate research, training, and clinical operations around diabetes, metabolism, and obesity. This PhD program is one example of a program that will unite DMC and the College of Health research priorities.

As you know, diabetes has risen to epic proportions across the US: 29.1 million people (9.3% of the US population) have diabetes and 27.8% of these people remain undiagnosed. If the current diabetes epidemic is not fully addressed, the CDC estimates that as many as one in three people in the US will have diabetes by the 2050 at a cost of more than \$1.3 trillion per year to the US economy.

It is well documented that lifestyle interventions through diet and exercise can prevent and reverse the effects of diabetes. Yet more research is needed to understand the physiological mechanisms by which these interventions act and to develop effective intervention programs tailored towards patient lifestyle and clinical indications. A PhD program in Nutrition and Integrative Physiology, will train a cadre of highly educated researchers who can lead independent research programs to address these and other important questions.

The DMC is equipped to help support this program through multiple programmatic elements. The DMC includes over 65 active researchers from 6 colleges across campus who have expertise in a wide variety of research areas related to diabetes, obesity, and metabolism. Many of our DMC principle investigators could serve as research mentors for students in this PhD program. Additionally, the DMC hosts weekly seminar series (Seminars in Metabolism) and annual

research symposia with both internal and external research speakers and students in this PhD program would be welcome to attend. We envision this PhD program to allow for new innovative research collaborations between the DMC and College of Health to address the pressing need for better prevention and treatment for people with diabetes and other metabolic diseases.

Dr. Metos, I applaud your enthusiasm and commitment to training the next generation of researchers in the fields of Nutrition in Integrative Physiology. I look forward to fully supporting this effort.

Sincerely,

A handwritten signature in black ink that reads "Simon Fisher". The signature is written in a cursive, flowing style.

Simon Fisher, MD, PhD  
Chief, Division of Endocrinology, Metabolism and Diabetes  
Co-Director of the Diabetes, Metabolism and Obesity Research Center  
Professor of Medicine and Biochemistry  
George Cartwright Endowed Chair in Internal Medicine





October 7, 2015

Julie Metos, PhD, RD  
Chairperson, Division of Nutrition and Integrative Physiology  
College of Health  
217 North HPER  
250 South 1850 East  
Salt Lake City, UT 84112

Re: PhD Degree in Nutrition and Integrative Physiology

Dear Julie:

I fully support a PhD degree in Nutrition and Integrative Physiology as part of the new Division of Nutrition and Integrative Physiology. The Spencer S. Eccles Health Sciences Library is committed to fostering the growth and development of students through the provision of information, teaching life-long learning strategies, and encouraging discovery.

Eccles Library faculty and staff provide access to a wealth of information resources and tools designed to support learners, researchers, and educators in health professions, and we will continue to partner with the Marriott Library to provide access to key journals, books, and databases to support your learners and your faculty. We are also available to provide course-integrated learning opportunities for your students, particularly those aligned with health information seeking and understanding, as well as individual consultations for faculty, staff, and students.

Again, I am delighted to have this opportunity to express my support for your PhD program in Nutrition and Integrative Physiology, and I look forward to its success and many rewarding partnerships.

Sincerely,

A handwritten signature in black ink that reads 'Jean P. Shipman'. The signature is written in a cursive style.

Jean P. Shipman, MSLS, AHIP, FMLA  
Director



October 7, 2015

Julie Metos, PhD, RD  
Chairperson, Division of Nutrition  
College of Health

Dear Dr. Metos:

I am pleased to offer this letter of support for the proposed doctoral program in Nutrition and Integrative Physiology (NUIP). This program illustrates one of the benefits associated with the realignment of the College of Health from seven academic units into five. Specifically, the relocation of existing degree programs to newly formed units will provide enhanced scholarship opportunities for faculty and enriched areas of graduate study not previously available to students. The Department of Exercise and Sport Science (ESS) agrees to donate its doctoral program to NUIP, along with three tenured faculty members, to create a critical mass of experienced scholars who have complementary areas of investigation. The merger of ESS with the Departments of Health Promotion and Education and Parks, Recreation and Tourism, ensures that our new entity, the Department of Health, Kinesiology and Recreation, retains a doctoral program.

The proposed doctoral program you have outlined is well conceived. The required coursework reflects a distinct area of study and highlights the expertise of faculty in NUIP. Further, students will take courses from other units across campus, allowing them to hone their programs of study according to their research emphases and academic goals.

I understand that some ESS classes will be cross-listed in NUIP to facilitate the seamless transition of current doctoral students being mentored by faculty relocating to NUIP. This important action will allow students to complete their approved or planned programs of study without disruption as College realignment progresses.

Congratulations on creating this outstanding new doctoral program in the Department of Nutrition and Integrative Physiology. I support your efforts with great enthusiasm!

Sincerely,

A handwritten signature in blue ink, appearing to read 'Janet M. Shaw', with a long horizontal flourish extending to the right.

Janet M. Shaw, PhD, FACSM  
Associate Professor and Chair



September 21, 2015

Julie Metos, PhD, RD  
Chairperson  
Department of Nutrition and Integrative Physiology  
University of Utah College of Health

Dear Dr. Metos,

I am pleased to write in support of your effort to establish a PhD program in Nutrition and Integrative Physiology. I am excited about the efforts being made in the College of Health to consolidate research excellence and to support it in several ways. It will be very important for existing and newly recruited principal investigators to have access to high quality PhD students. I also think that the curriculum outlined for this program will be rigorous, both in terms of required coursework and examinations. I would suggest that this program interact closely with the bioscience graduate programs on campus and take advantage of all opportunities for synergy. I wish you the best as you design, establish and grow this graduate program.

Sincerely,



Jared Rutter, Ph.D.  
Professor of Biochemistry  
Dee Glen and Ida Smith Chair for Cancer Research  
Co-Director, Diabetes and Metabolism Center, University of Utah  
Co-Leader, Nuclear Control of Cell Growth and Proliferation Program, Huntsman Cancer  
Institute



Dr. Julie Metos  
Chair, Division of Nutrition  
University of Utah  
September 20, 2016

Dear Dr. Metos,

We are pleased to support the application for the Division of Nutrition, soon to be formally recognized as the Department of Nutrition and Integrative Physiology, to offer a Ph.D. program. We both have Adjunct appointments with the Division of Nutrition, and hold collaborative / weekly laboratory meetings with several of its existing faculty members, including Drs. Velayutham and Jalili. These two investigators have research interests that parallel our own i.e., the cellular mechanisms that contribute to cardiovascular complications that develop in the context of insulin resistance, obesity, and type 2 diabetes mellitus. Over the years, in collaboration with Drs Velayutham and Jalili, we have mentored undergraduate research volunteers, Undergraduate Research Opportunities Program participants, Masters Students (Division of Nutrition and Department of Exercise and Sports Science), and Ph.D. students (Department of Exercise and Sports Science) on projects involving cell systems, isolated tissues, intact animals, and humans. This has resulted in publications in top quality journals, and both internal and external grant funding for students and faculty. At present, while it is possible for students in the College of Health to obtain a Ph.D. concerning a Nutrition-related topic, their actual degree source is the Department of Exercise and Sports Science. It is fact that this dampens enthusiasm for some students to attend the University of Utah, and this likely has caused some prospective applicants to apply elsewhere. The ability of the Department of Nutrition and Integrative Physiology to offer a Ph.D. program will allow bright and motivated students to complete their academic training at the University of Utah, which will bolster the existing individual and collaborative research programs of the current investigators. Additionally, the ability for the University of Utah to offer a PhD program in Nutrition and Integrative Physiology will undoubtedly enhance recruitment of top-quality faculty to this newly developed Department. Taken together, thriving research programs of existing and newly recruited faculty will enhance the learning and investigative experience for the Ph.D. candidate.

The Diabetes and Metabolism Center is a relatively new unit that has been formed at the University of Utah to foster translational and transdisciplinary studies under the umbrella of Diabetes-related research. It brings together Investigators from a variety of interest areas that are involved in basic and clinical research with Diabetes being the common thread among all. This Center will be attractive to many prospective Ph.D. students interested in Diabetes-related research, as Nutrition makes an enormous contribution to the prevention and management of this disease. In this regard, it is not unreasonable that many students would form Ph.D. committees consisting of Investigators from the Department of Nutrition and Integrative Physiology, together with Investigators that are members of the Diabetes and Metabolism Center. In addition, this relationship would be idea for fostering a T32 Multidisciplinary Training Grant that would

Division of Endocrinology, Metabolism, and Diabetes

Department of Internal Medicine  
School of Medicine  
30 N. 2030 East  
Salt Lake City, Utah 84132  
(801) 581-0950 · FAX (801) 585-0956

develop infrastructure for pre and postdoctoral trainees interested in Nutrition-Diabetes related research. Again, this would be beneficial to students, faculty, the Department, the Diabetes and Metabolism Center, and the University community as a whole. This is an opportune time for the Department of Nutrition and Integrative Physiology to begin a formal PhD program in Nutrition. We look forward to working with existing and newly-recruited faculty, and new graduate students in this doctoral program, and will support its needs wholeheartedly in every possible way.

Sincerely,

J. David Symons, PhD



J. David Symons, PhD

Professor

University of Utah

College of Health, Departments of Exercise and Sports Science and Division of Nutrition; and Department of Internal Medicine, Division of Endocrinology, Metabolism, and Diabetes; Investigator, Molecular Medicine Program.

Timothy E. Graham, MD



Associate Professor of Medicine  
Adjunct Associate Professor of Biochemistry  
Adjunct Assistant Professor of Nutrition  
Senior Investigator in Molecular Medicine  
University of Utah

Executive Medical Director of Diabetes, Obesity, and Endocrinology  
University of Utah Health Care

October 2, 2015

Julie Metos, PhD, RD  
Assistant Professor  
Chairperson, Division of Nutrition and Integrative Physiology  
University of Utah College of Health  
250 S 1850 E RM 200  
Salt Lake City, Utah 84112

Re: Doctoral Degree in Nutrition and Integrative Physiology

Dear Professor Metos:

This letter is in support of the Nutrition and Integrative Physiology doctoral program.

The Marriott Library has provided resources for Nutrition and for Exercise Physiology programs for many years by purchasing essential journals, books, films and databases. The Library remains committed to continuing its support for scholars in the Nutrition and Integrative Physiology program.

The Marriott Library maintains extensive holdings of scholarly journals in this discipline, including *Progress in Lipid Research*; *Annual Review of Nutrition*; *American Journal of Clinical Nutrition*; *Nutrition Research Reviews*; *Nutrition Reviews*; the *International Journal of Obesity*; the *Journal of Nutrition*; *Physiological Reviews*; *Annual Review of Physiology*; the *Journal of General Physiology*; *Journal of Physiology (London)*, the various sections of the *American Journal of Physiology*, and many other related titles. However, there are a few additional highly ranked journals for which the Library does not have a subscription. As the scholarly communication landscape evolves, new options may exist beyond subscriptions for providing access to journal literature, and we would like to work with faculty to evaluate the most workable preferences for providing periodical literature to support the program.

The Marriott Library has an approval plan which automatically provides for the acquisition of English language scholarly books published on nutrition, physiology, and other relevant topics. The Library also encourages faculty to work with librarians to strengthen book collections in subject areas where it may be necessary.

We feel that our collection is strong in indexes, abstracts, and databases supporting the program. The University of Utah maintains subscriptions to the following databases:

- |   |                                    |
|---|------------------------------------|
| 1. PubMed (or Medline)                    | 8. Nutrition Abstracts and Reviews |
| 2. Embase                                 | 9. Biosis                          |
| 3. Scopus                                 | 10. Biological Sciences Collection |
| 4. ClinicalKey                            | 11. Agricola                       |
| 5. Web of Science                         | 12. SportDiscus                    |
| 6. Dissertations & Theses: Full Text      | 13. Academic Search Premier        |
| 7. SciFinder Scholar (Chemical Abstracts) | 14. Cochrane Library               |

Student difficulties in locating materials often do not arise from collection weaknesses, but from the complexities of using a large research library. The Marriott Library also offers class presentations and one-to-one consultations to help graduate students find the most relevant works and suggest the most appropriate search strategies.

Sincerely,



Rick Anderson, Associate Dean  
Collections and Scholarly Communication  
J. Willard Marriott Library



Catherine Soehner, Associate Dean  
Research and User Services  
J. Willard Marriott Library



*Annette Poulson Cumming  
Presidential Endowed Chair  
in Women's and Reproductive Health*

September 23, 2015

Julie Metos, PhD, RD  
Chairperson, Division of Nutrition  
College of Health

Dear Dr. Metos,

I am pleased to support the proposed doctoral program in Nutrition and Integrative Physiology in the College of Health. During my participation in the Graduate Council's Internal Review of the Division of Nutrition, the importance of settling the restructuring of the College and strategically planning a joint PhD program with other divisions was a prime recommendation. I am pleased to see that the restructuring has been finalized, and that this new department is now able to develop a doctoral program to advance the scientific knowledge of nutrition and exercise physiology. The development of new knowledge in these research areas is critical to improving the health and wellness of individuals, and by extension, the population. This is good news, and I offer my full support.

Sincerely,

A handwritten signature in cursive script, reading 'Patricia Akins Murphy'.

Patricia Akins Murphy, CNM, DrPH, FACNM, FAAN  
Professor  
College of Nursing