The doctoral minor in nutritional sciences aims to articulate, critique, and elaborate the theories, research methods, and approaches to inquiry in nutritional sciences. Specific knowledge areas of focus include intermediary metabolism, functions and metabolism of vitamins and minerals, nutrition-related diseases such as obesity and diabetes, and fundamental principles of epidemiology and nutrition policy.

Those completing the doctoral minor in nutritional sciences are expected to identify sources and assemble evidence pertaining to questions or challenges in nutritional sciences, recognize the most appropriate methodologies and practices, evaluate or synthesize information pertaining to questions or challenges in nutritional sciences, communicate clearly in ways appropriate to the field of nutritional sciences, and recognize and apply principles of ethical professional conduct.

### REQUIREMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUTR SCI/BIOCHEM 510</td>
<td>Nutritional Biochemistry and Metabolism</td>
<td>3</td>
</tr>
<tr>
<td>NUTR SCI/BIOCHEM 619</td>
<td>Advanced Nutrition: Intermidiiary Metabolism of Macronutrients</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Choose three of the following: ^1</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI/POP HLTH 621</td>
<td>Introduction to Nutritional Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>NUTR SCI/M&amp;ENVTOX 623</td>
<td>Advanced Nutrition: Minerals</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI 625</td>
<td>Advanced Nutrition: Obesity and Diabetes</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI/AN SCI 626</td>
<td>Experimental Diet Design</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI 627</td>
<td>Advanced Nutrition: Vitamins</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI 881</td>
<td>Seminar-Topics in Human and Clinical Nutrition (presentation required)</td>
<td></td>
</tr>
<tr>
<td>or NUTR SCI/BIOCHEM 901</td>
<td>Seminar-Nutrition and Metabolism (Advanced)</td>
<td></td>
</tr>
</tbody>
</table>

^1 Appropriate NUTR SCI 875 Special Topics courses can be used to substitute for any of the 1-credit courses above with prior approval of the graduate program coordinator.
Yen, Eric, Assistant Professor of Nutritional Sciences; Ph.D. 2000. Intestine, assimilation of dietary fat, and energy balance

**MEMBERS OF THE INTERDEPARTMENTAL GRADUATE PROGRAM IN NUTRITIONAL SCIENCES FROM OUTSIDE THE DEPARTMENT:**

Anderson, Rozalyn, Assistant Professor, Ph.D. 2000. Nutrient sensitive regulatory pathways in aging and age-associated disease

Armentano, Louis, Professor of Dairy Science; Ph.D. 1982. Ruminant nutritional physiology and the role of ruminants in using by-products derived from processing plants for human use

Attie, Alan, Professor of Biochemistry; Ph.D. 1980. Cell biology of lipoprotein assembly; genetics of obesity and diabetes

Binkley, Neil, Associate Professor of Medicine, M.D. 1979. Vitamin K insufficiency and osteoporosis

Carey, Hannah, Professor of Veterinary Medicine; Ph.D., 1983. Gastrointestinal physiology; intestinal adaptation; mammalian hibernation and its application to biomedicine; cellular and physiological responses to stress

Clagett-Dame, Margaret, Professor of Biochemistry and Pharmaceutical Sciences; Ph.D., 1985. Vitamin A and nervous system development; therapeutic uses of retinoids and vitamin D analogs

Combs, David, Professor of Dairy Science; Ph.D., 1985. Ruminal digestion and metabolism of forages by dairy cattle; food intake regulation in ruminants

Crenshaw, Thomas, Professor of Animal Science; Ph.D. 1980. Skeletal tissue growth and assessment; statistical approaches to establishment of mineral and amino acid requirements; swine nutrition

Davis, Dawn, Assistant Professor; M.D, Ph.D. 2003. Dissertation: "Changes in pancreatic beta cell gene expression in response to obesity and in the setting of beta cell proliferation"

Denu, John, Professor of Biomolecular Chemistry; Ph.D. 1993. Investigation of the proposed "Histone Code"; understanding the mechanisms of enzymes that reversibly modify proteins and the effects of these modifications on protein function

Engin, Feyza, Assistant Professor of Biomolecular Chemistry; Ph.D., 2007. Investigating the molecular mechanisms of organelle dysfunction and cellular stress responses in the pathogenesis of mitochondrial diseases

Funk, Luke, Assistant Professor of Surgery. 2005 MD, Ph.D., FACS. Bariatric and metabolic surgery, esophageal and gastric disorders, abdominal wall hernias and gall bladder disorders

Goldman, Irwin, Professor of Horticulture; Ph.D. Vegetable breeding and genetics, human health attributes of vegetable crops and breeding of vegetables for culinary quality

Hayes, Colleen, Professor of Biochemistry; Ph.D. 1973. Vitamin D regulation of immune function and autoimmune disease; genetic and biochemical analysis of B-lymphocyte survival and apoptosis signaling

Hernandez, Laura, Assistant Professor of Dairy Science; Ph.D. 2008. Regulation of lactation and milk synthesis in relation to the autocrine, paracrine, endocrine and serotonin systems. Regulation of mammary gland calcium transport and maternal calcium homeostasis during lactation

Kanarek, Marty, Professor of Population Health Sciences and Environmental Studies; Ph.D. 1978. Environmental epidemiology; potential population health effects from consumption of fish contaminated with mercury, PCBs, and other chemicals

Karasov, William, Professor of Wildlife Ecology; Ph.D., 1981. Molecular mechanisms of intestinal enzyme adaptation, intestinal absorption, nutritional ecology of wild vertebrates

Kemnitz, Joseph, Professor of Cell and Regenerative Biology (also Director for Translational Technologies and Resources for Institute for Clinical and Translational Research); Ph.D., 1976. Regulation of energy balance; consequences of energy imbalances in early development and aging; nonhuman primate models

Kimple, Michelle, Assistant Professor of Medicine; Ph.D. 2003. Pancreatic beta-cell response to nutrient and hormonal stimulation

Kling, Pamela, Associate Professor of Pediatrics; M.D. 1985. Erythropoiesis, iron metabolism and roles of erythropoietin in early development

Knoll, Laura, Associate Professor of Medical Microbiology & Immunology; Ph.D. 1994. Using -omics technology to study host/ pathogen interactions and metabolism of the intracellular parasite Toxoplasma gondii

Kudsk, Kenneth, Professor of Surgery; M.D., 1975. Effect of route and type of nutrition on surgical outcome; mucosal immunity and response to infection

Lamming, Dudley, Assistant Professor of Endocrinology, Diabetes, and Metabolism; Ph.D., 2008. Protein regulation of cellular processes that affect growth, metabolism, and aging

Mares, Julie, Professor of Ophthalmology; Ph.D., 1987. Epidemiological study of relationships between diet and age-related eye disease

Malecki, Kristen, Assistant Professor of Population Health Sciences, Ph.D. 2005. Epidemiological study of relationships between environment and health; system-science approaches to addressing health disparities, translational community base environmental health research

Merrins, Matthew, Assistant Professor of Medicine; PhD., 2008. Ability of pancreatic islet beta cells to trigger cell proliferation and release of insulin during periods of increased insulin demands

Pagliarini, Dave, Director of Metabolism, Morgridge Institute for Research; Associate Professor of Biochemistry; Ph.D., UC- San Diego. Integrating large-scale molecular profiling with mechanistic biochemistry to systematically annotate the functions of mitochondrial proteins


Reed, Jess, Professor of Animal Sciences; Ph.D. 1983. Flavonoids and other phytochemicals in animal and human health and nutrition

Reeder, Scott, Professor. MD. Ph.D. Abdominal adiposity, liver fat, liver iron overload and other features of diffuse liver disease, quantification of
perfusion in liver tumors, hemodynamics of portal hypertension, and the use of new contrast agents in liver and biliary diseases

**Schaefer, Daniel,** Professor of Animal Sciences; Ph.D., 1979. Growth of beef cattle in grazing and feedlot systems

**Simon, Philipp,** Professor of Horticulture; Ph.D., 1977. Biochemical genetics and breeding of carrots, alliums, and cucumber; genetic improvement of vegetable culinary and nutritional value

**Trentham-Dietz, Amy,** Professor of Cancer Epidemiology. Ph.D. 1997. Modifiable lifestyle factors including obesity, physical activity, and environmental factors to better understand breast cancer etiology and reveal avenues for prevention

**Westmark, Cara,** Assistant Professor of Neurology. Ph.D. Alzheimer's disease and fragile X syndrome focuses on the synaptic function of amyloid beta protein precursor (APP) and amyloid-beta

**White, Heather,** Assistant Professor of Dairy Science; Ph.D. 2010. Nutritional Physiology – Focus on hepatic carbon flux specifically during the coordinated responses to the transition to lactation, nutrition, and stress in dairy cattle and during onset and progression of NAFLD and NASH in humans

**SUPPORT STAFF**

**Graduate Coordinator:** Katie Butzen MS.Ed., kbutzen@wisc.edu