ASSESSMENT REPORT 2017-2018

Major in Nutrition, Nutrition Science Option (BS)

The nutrition science (NSPM) option provides students with a curriculum well-grounded in the basic sciences with the practical application of the principles of physiology and biochemistry to the science of nutrition. The program is designed to meet the requirements for application to professional schools including medical, dental, optometry, physical therapy and other paramedical programs. In addition, this option prepares students for graduate study in nutrition and other health-related disciplines. During the 2017-2018 academic year, 54 undergraduate students were enrolled in the NSPM major.

Mission: *The mission of the Nutrition Science major at Auburn University is to provide a high quality program of study that integrates the core nutrition science courses with additional courses in chemistry, physics, and biology to prepare graduates for entry into professional/graduate schools or nutrition-related careers dedicated to enhancing human well-being and quality of life.*

Student Learning Outcomes

1. **Specificity of Outcomes**

   SLO 1: Students will be able to describe the digestion, absorption, and metabolism of the energy yielding nutrients (carbohydrates, lipids and proteins).

   SLO 2: Students will be able to describe the digestion, absorption, and metabolism of the non-energy yielding nutrients (vitamins and minerals).

   SLO 3: Students will be able to determine nutrient needs and recommendations associated with different life cycle stages.

   SLO 4: Students will effectively communicate through well-organized writing that enhances a reader's ability to understand nutrition research findings through critique and analysis of primary research studies in nutrition science.

   SLO 5: Students will identify nutrient requirements to maintain health and body function and know food-sources for each nutrient.

   SLO 6: Students will be able to describe the basic concepts of nutritional genomics through the effects of nutrients on gene regulation and nutrient-gene interactions on human health.

   SLO 7: Students will generate an effective e-portfolio as a mechanism for professional development in nutrition science.

2. **Comprehensive Outcomes**
   The above student learning outcomes are comprehensive for the NSPM major. While there is not a specific accrediting agency for the NSPM major, student learning outcomes are aligned with disciplinary standards.

3. **Communicating Outcomes**

The program and student learning objectives are posted on the NSPM website. Nutrition faculty meet on a regular basis to discuss program and student learning objectives as well as outcomes from the assessment findings. For communicating student learning outcomes to students, we have formulated a

working focus group of select juniors and seniors. We will share assessment data with this group so feedback can be provided. In addition, during an orientation session with incoming freshman, we will outline student learning objectives for the program.

Curriculum Map

4. Below is a curriculum map for the NSPM option that visualizes the alignment between our student learning outcomes and the required courses in our program.

Curriculum Map
Nutrition Science (NSPM) Option

Nutrition Courses	SLO 1	SLO 2	SLO 3	SLO 4	SLO 5	SLO 6	SLO 7
NTRI 2000 Nutrition and Health	1	1	1		1	1	
NTRI 2070 Careers in Nutrition, Dietetics and Wellness							1
BCHE 3180 Nutritional Biochemistry	1,2						
NTRI 4820 Macronutrients	1,2,3			1	2,3	1	
NTRI 4830 Vitamins and Minerals		1,2,3			2,3	1	
NTRI 5820 Nutrition in the Life Cycle			2,3	2			
NTRI 5100 Nutrition in Disease Prevention		2	2	2,3	2		
NTRI 5830 Nutritional Genomics				2,3		1,2,3	

1=introduced, 2=reinforced, 3=emphasized

Measurement

5. <u>Outcome-Measure Alignment</u>

SLO 1 – Objective course exams: assessment of SLO 1 was evaluated using 4 exams in NTRI 4820 (Macronutrients) for spring 2018. Questions from 3 one-hour exams and the final exam were used for SLO assessment. Questions used evaluated students' knowledge of carbohydrate, lipid, and protein subject matter in the areas of digestion, absorption and metabolism.

SLO 2 – Pre-test/post-test: assessment of SLO 2 was evaluated using a pre-test/post-test in NTRI 4830 (Vitamins and Minerals) for spring 2018. Questions used evaluated students' knowledge of vitamins and minerals subject matter in the areas of digestion, absorption and metabolism.

SLO 3 – Growth chart project: assessment of SLO 3 was assessed using a growth chart project to critically evaluate students understanding of nutrition needs for a specific life cycle stage. This was

assigned in NTRI 5830 (Nutrition in the Life Cycle) for fall 2017. A rubric containing how assessment for this assignment is done is provided with the results.

SLO 4 – Evaluation writing assignment: assessment of SLO 4 was assessed using a writing assignment evaluating students' ability to critically evaluate and interpret scientific published literature examining the effectiveness of a dietary supplement in the prevention and/or treatment of a disease/health condition. This was assigned in NTRI 5100 (Nutrition in Disease Prevention) for spring 2018. A rubric containing how assessment for this assignment is done is provided with the results.

SLO 5 – Pre-test/post-test: assessment of SLO 5 will be evaluated using a pre-test/post-test in NTRI 4820 (Macronutrients) and NTRI 4830 (Vitamins and Minerals) starting in spring 2019. Questions used will evaluate students' knowledge of nutrient requirements and food sources for carbohydrates, lipids and proteins (NTRI 4820) and vitamins and minerals (NTRI 4830).

SLO 6 - Pre-test/post-test: assessment of SLO 6 was evaluated using a pre-test/post-test in NTRI 5830 (Nutritional Genomics) in spring 2018. Questions used evaluated students' knowledge of the basics of genomics, nutrient-gene interactions and gene regulation.

SLO 7 – E-portfolio project: assessment of SLO 7 was evaluated using a e-portfolio design project in NTRI 2070 in spring 2018. This project was designed to effectively communicate educational and professional experiences of NSPM students as a tool for professional development. A rubric containing how assessment for this assignment is done is provided with the results.

6. **Direct Measures**
   With the exception of SLO 5 (which needs an assessment tool developed), each SLO has a direct measurement.

7. **Data Collection**
   SLO 1: Data was collected during the spring term (2018) in NTRI 4820. Data was collected from each of the exams by the course instructor delineating scores on questions related to digestion, absorption, and metabolism for each of the macronutrients: proteins, carbohydrates, and lipids. Each of the questions were identified as relating to the following topics: carbohydrate digestion, carbohydrate absorption, and carbohydrate metabolism; lipid digestion, lipid absorption, and lipid metabolism; and protein digestion, protein absorption, and protein metabolism. Question distribution for the various topics were as follows: 14 questions for carbohydrate digestion, 11 questions for carbohydrate absorption, and 29 questions for carbohydrate metabolism; 12 questions for lipid digestion, 8 questions for lipid absorption, and 31 questions for lipid metabolism; and 9 questions for protein digestion, 6 questions for protein absorption, and 23 questions for protein metabolism. Results were tallied at the end of the semester and stratified by each option within the Nutrition major (NSPM, NTDI, NTWE). Students in the NTRI 4820 class are juniors within the program. A total of 15 NSPM students were enrolled in the course. All NSPM students were used for the assessment.

   SLO 2: Data was collected from all students enrolled in NTRI 4830 during the spring term 2018. Students are juniors within the nutrition major across all options (NSPM, NTDI, NTWE). A 20 question pre-test/post-test was used for the assessment. The test consisted of 11 short answer questions specific for vitamin knowledge and 9 short answer questions specific for mineral knowledge. The pre-test was given on the first day of class while the post-test was given on the last day of class. All students were present on both days. The number of correct responses to both the pre-test and post-test on a question-by-question basis were reviewed by the faculty member and reported to the assessment coordinator. A total of 15 NSPM students were enrolled in the course. All NSPM students were used for the assessment.

SLO 3: Data was collected from NSPM students enrolled in NTRI 5820 during the fall term 2017. A total of 15 NSPM students were enrolled in the class. All NSPM students were used for the assessment. Students are seniors within the nutrition major. A growth chart project assignment was required to give nutrition students experience making and interpreting growth charts for a specific life cycle stage (infancy). Students were required to generate an appropriate growth chart from growth data of 5 infants. The name and gender of each infant is provided. Measurements were taken at birth, 4 months, and 12 months of age. Weights are shown in pounds (lb.) and ounces (oz.), while lengths/heights are shown in inches. For each infant, transfer the data below to the table on the gender appropriate growth chart, and plot the weight and length data on a growth chart. The students were required to examine the growth curves for weight and length of each infant and address the following questions:

a. On what percentile does the plot begin? On what percentile does the plot end?
b. Does the percentile change with age?
c. What could be the potential reason for any possible change?

Also, the students had to determine which of the following situations/conditions best fits with each infant's growth curve and provide a rationale for making the selection.
Possible situation/condition
1) constitutional short stature
2) growth hormone deficiency
3) infantile obesity
4) normal catch up growth

A grading rubric is provided with the results of this assessment.

SLO 4: Data was collected from NSPM students enrolled in NTRI 5100 during the spring term 2018. Students enrolled in this course are seniors within the NSPM major. A writing assignment requiring students to research, critically evaluate, and interpret scientific published studies the effectiveness of a dietary supplement in the prevention and/or treatment of a disease/health condition was used as the assessment instrument. Students were responsible for selecting a dietary supplement or a dietary approach that is purported to prevent and/or treat a specific disease or condition. Students were required to present information from at least 5 scientific journal articles. Original research topics were approved by the course instructor prior to starting the assignment. A total of 11 NSPM students were enrolled in the class and used for the assessment for spring 2018. Historical data from the spring 2016 class (n=11) and spring 2017 (n=3) are also provided for analysis.

SLO 6: Data was collected from all students enrolled in NTRI 5830 during the spring term 2018. Students are seniors within the nutrition major across the NSPM and NTDI options. A 10 question pre-test/post-test was used for the assessment. The test consisted of questions specific for basic genomic knowledge, understanding gene regulation and gene-diet interactions. The pre-test was given on the first day of class while the post-test was given on the last day of class. All students were present on both days. The number of correct responses to both the pre-test and post-test on a question-by-question basis were reviewed by the faculty member and reported to the assessment coordinator. A total of 10 NSPM students were enrolled in the course. All NSPM students were used for the assessment.

SLO 7: Data was collected from all NSPM students enrolled in NTRI 2070 during spring term 2018. Students were a mixture and sophomores and juniors within the NSPM major. A total of 19 NSPM students were enrolled in the course. A total of 18 NSPM students were used in the assessment (one student did not turn in the assignment). Students were required to produce an effective ePortfolio to establish their academic and professional identities as a professional development tool for nutrition science. Students were instructed through lecture material in class on how to develop and formulate an ePortfolio. A grading rubric is provided in the results section of this assessment.

Results

8. **Reporting Results**
   SLO 1 – Objective course exams for carbohydrate, lipid and protein knowledge

Digestion, Absorption, and Metabolism (NTRI 4820 Macronutrients) 2017-2018				
N = 15	Digestion	Absorption	Metabolism	MEAN
Proteins	77.8%	75.7%	75.4%	76.3%
Carbohydrates	74.6%	78.1%	67.8%	73.5%
Lipids	70.3%	82.3%	66.5%	73.0%
MEAN	74.2%	78.7%	69.9%	

Digestion, Absorption, and Metabolism (NTRI 4820 Macronutrients) 2016-2017				
N = 10	Digestion	Absorption	Metabolism	MEAN
Proteins	82.3%	78.7%	63.8%	74.9%
Carbohydrates	69.1%	80.4%	64.3%	71.3%
Lipids	71.9%	78.5%	63.2%	71.2%
MEAN	74.4%	79.2%	63.8%	

Digestion, Absorption, and Metabolism (NTRI 4820 Macronutrients) 2015-2016				
N = 5	Digestion	Absorption	Metabolism	MEAN
Proteins	84.0%	73.1%	67.4%	74.8%
Carbohydrates	60.6%	90.2%	62.5%	71.1%
Lipids	73.3%	70.0%	58.5%	67.3%
MEAN	72.6%	77.8%	62.8%	

SLO 2 – Pre-test/post-test for vitamin and mineral knowledge

	Pre-test/Post-test Data (NTRI 4830 Vitamins and Minerals) 2017-2018				
N = 15					
	Pre-test **(avg. score)**	**Post-test** **(avg. score)**	**Pre-test** **(avg. %)**	**Post-test** **(avg. %)**	
Vitamin knowledge	0.4/10	3.5/10	4.0%	**35.0%**	
Mineral knowledge	0.2/10	6.2/10	2.0%	**62.0%**	
Total	**0.5/20**	**9.7/20**	**5.0%**	**48.5%**	

	Pre-test/Post-test Data (NTRI 4830 Vitamins and Minerals) 2016-2017				
N = 10					
	Pre-test **(avg. score)**	**Post-test** **(avg. score)**	**Pre-test** **(avg. %)**	**Post-test** **(avg. %)**	
Vitamin knowledge	0.0/11	2.0/11	0.0%	**18.2%**	
Mineral knowledge	0.2/9	5.0/9	2.2%	**55.5%**	
Total	**0.1/20**	**6.4/20**	**0.5%**	**32.0%**	

Pretest/posttest in NTRI 4830: Vitamins and Minerals

1. Which vitamin can form a covalent bond with a lysine residue of proteins (vitamin)?
2. Eighty percent of phosphorus in grains is in what form (mineral)?
3. A deficiency in what vitamin can be determined by a tryptophan load test (vitamin)?
4. The transient receptor potential V6 (TRPV6) channel is involved with the absorption of which mineral (mineral)?
5. Which vitamin works by donating or receiving a one-carbon entity in different oxidation states (vitamin)?
6. Which mineral has its highest concentrations in hair, skin, and nails (mineral)?
7. A deficiency of which vitamin is associated with Wernicke-Korsakoff syndrome (vitamin)?
8. Hephaestin is involved with the absorption of which mineral across the basolateral membrane of small intestinal cells (mineral)?
9. Vitamin C is made from what compound (vitamin)?
10. The red blood cell hemolysis test is used to determine whether there is a deficiency of which vitamin (vitamin)?
11. Acrodermatitis enteropathica is the result of a genetic mutation that leads to the poor absorption of which mineral (mineral)?
12. Cubilins is part of the receptor in the small intestine for what vitamin (vitamin)?
13. Which mineral acts to help stabilize ATP and ADP (mineral)?
14. Which mineral is known to potentiate the action of insulin (mineral)?
15. What color is riboflavin (vitamin)?
16. The hormone aldosterone in released from the adrenal cortex in response to low plasma concentration of what mineral (mineral)?
17. During the visual cycle, light converts 11-cis retinal into what form of vitamin A (vitamin)?
18. The inhibition of what kind of mineral channel is involved with the release insulin in response to a carbohydrate load (mineral)?
19. What hormone works with vitamin D to help increase plasma calcium concentrations (vitamin)?
20. Pellagra is a deficiency disease of what vitamin (vitamin)?

SLO 3 – Life-cycle growth chart project

Rubric Criteria	Avg. Score
Completeness of table (10 pts)	9.3/10.0 (93%)
Selecting the appropriate chart (5 pts)	5.0/5.0 (100%)
Completeness of chart (15 pts)	13.8/15.0 (90.7%)
Interpretation of each growth chart (10 pts)	8.7/10.0 (87%)
	36.8/40.0 (92.0%)

SLO 4 – Evaluation writing assignment

Table: Data from NTRI 5100: Nutrition and Disease Prevention (Spring 2016-2018)

Supplement Evaluation Research Paper Rubric

	Highly Competent	Not Competent	Weight	2016 Avg Score (n=11)	2017 Avg Score (n=3)	2018 Avg Score (n=11)
Title	*The title is clear and concise.*	*Lack of structure or clarity.*	3 pts.	3.0	3.0	3.0
Introduction	*Background sources are varied, high quality, pertinent, sufficient, and include primary sources where possible. Background clearly enhances the reader's ability to understand the topic. . The criteria used to select the studies are clear.*	*Too few sources are used, some or all are not pertinent, and available primary sources are not included. A disconnect exists between the background and topic. The criteria used to select the studies are absent.*	8 pts.	6.4	7.0	6.9
Articulate the thesis statement	*Thesis statement is specific, clear, original, and thoughtful, with the potential to contribute to knowledge in the field.*	*Thesis statement is posed with so little clarity as to be confusing, or it is absent.*	3 pt.	2.1	2.7	2.4
Main text	*Articles are relevant, important, and balanced, including recent articles. Word choice and tone enhance the discussion of the research.*	*Articles lack relevance, quality, depth and/or balance. Word choice and tone are poor.*	8 pts.	6.7	7.0	7.7
Summary	*The summary is clear, thorough, and appropriate to the thesis statement. Findings are presented clearly, ignoring unimportant results and highlighting the most significant ones.*	*The summary is missing, unclear, simplistic, or biased. Analysis is unrepresentatively selective or unrelated to the thesis statement.*	8 pts.	7.9	7.7	7.0

Conclusions	*Conclusions are present, logical, related to the studies examined, supported by argument and evidence.Writing is well organized and enhances the reader's ability to understand the conclusions.*	*Conclusions are missing, unclear, illogical, irrelevant to the studies examined, or unsupported by argument or evidence.Writing is poorly organized. Errors significantly impair the reader's understanding of the findings and conclusions.*	8 pts.	7.5	8.0	7.7
References	*References are consistent and free of grammatical, syntax and typographical errors.*	*References are inconsistent and contain numerous grammatical, syntax and typographical errors.*	2 pts.	2.0	2.0	1.9
Effective and clear communica-tion	*Writing is free of grammatical, syntax and typographical errors, is well organized, and enhances the reader's ability to understand the content.*	*Writing contains significant grammatical, syntax, and typographical errors and is poorly organized. Errors significantly impair the content. Word choice and tone are poor.*	10 pts.	8.9	9.0	8.9
		Total	**50**	**44.6 (89.2%)**	**46.3 (92.6%)**	**45.5 (91.0%)**

SLO 6 - Pre-test/post-test for nutritional genomics

Nutritional Genomics Knowledge

2017-2018

Question #	Pre-test	Post-test
1	3/10 (30%)	9/10 (90%)
2	4/10 (40%)	4/10 (40%)
3	3/10 (30%)	8/10 (80%)
4	6/10 (60%)	9/10 (90%)
5	7/10 (70%)	9/10 (90%)
6	4/10 (40%)	10/10 (100%)
7	3/10 (30%)	7/10 (70%)
8	8/10 (80%)	10/10 (100%)
9	10/10 (100%)	10/10 (100%)
10	5/10 (50%)	10/10 (100%)
Total	**53/100 (53%)**	**86/100 (86%)**

1. Differences In DNA sequence found in >1% of the population are known as:
    a. mutations
    b. microsatellite DNA
    c. polymorphisms
    d. INDELS
    e. polycistronic DNA

2. A-T rich regions that are repeated numerous times in a chromosome identifies which of the following structures?
    a. telomeres
    b. chromatin
    c. centromeres
    d. SNPs
    e. restriction sites

3. Which of the following best describes a Mendelian trait?
    a. influenced by multiple genes
    b. influenced by diet and environment
    c. can only show a recessive pattern of inheritance
    d. influenced by a single gene
    e. can only show dominant pattern of inheritance

4. An arbitrary region of the genome that can have mutations and/or polymorphisms is known as a(n):
    a. satellite DNA
    b. telomere
    c. restriction site
    d. INDEL
    e. locus

5. RS numbers are used to designate:
    a. centromeres
    b. SNPs
    c. telomeres
    d. mutations
    e. genes

6. Silencing and/or activation of DNA without changing the nucleotide sequence is known as:
    a. mutations
    b. transcription
    c. translation
    d. proteomics
    e. epigenetics

7.   Among all humans, approximately_____% of DNA is different.
        a. 0%
        b. 0.1%
        c. 1%
        d. 5%
        e. 10%

8.   DNA methylation rich-regions in the human genome are referred to as:
        a. microsatellite DNA
        b. INDELS
        c. CpG islands
        d. polycistronic DNA
        e. genes

9.   An observable characteristic of an organism is called a:
        a. mutation
        b. genotype
        c. polymorphism
        d. transposition
        e. phenotype

10.   Sequence-specific DNA-binding proteins that regulate gene expression are known as:
        a. promoters
        b. transcription factors
        c. polymerases
        d. restriction enzymes
        e. INDELS

SLO 7 – ePortfolio assignment

n=19	Avg. Score
Content - Documentation	9.1/10.0
Layout	10.0/10.0
Navigation	9.1/10.0
Folder Structure	6.7/10.0
Graphics	9.8/10.0
Sounds	8.4/10.0
Reflections	7.6/10.0
Mechanics	9.5/10.0
Theme	9.3/10.0
Content- documents (artifacts)	9.7/10.0
	89.2/100

Rubric for ePortfolio project

	Proficient 5	Capable 4-3	Basic 2-1	Novice 1-0
Content-have you provided professional documentation?	• All of the following items are clearly present, appropriate and correct. 1. Statement of ownership, originality, confidentiality, availability of the document. 2. Philosophy statement. 3. Career/professional goals. 4. Resume.	• Many of the following items are clearly present and appropriate. Minor issues are present in the documents. 1. Statement of ownership, originality, confidentiality, availability of the document. 2. Philosophy statement. 3. Career/professional goals. 4. Resume.	• Some of the following items are present and appropriate. 1. Statement of ownership, originality, confidentiality, availability of the document. 2. Philosophy statement. 3. Career/professional goals. 4. Resume.	• Most of the following items are missing, inaccurate, or inappropriate. 1. Statement of ownership, originality, confidentiality, availability of the document. 2. Philosophy statement. 3. Career/professional goals. 4. Resume.
Layout- Is your ePortfolio organized sensibly?	• Design is attractive, colorful, and shows creativity. • Consistent format extends from page-to-page; ePortfolio design is intentional • The ePortfolio demonstrates careful thought about the order in which information is presented. Graphics are placed so as not to interfere with the content presented. The pages are laid out so as not to waste space or appear too crowded.	• Design is attractive and colorful. • Page layouts organized in a logical way; Headings and styles are consistent within pages; Text, images, and links flow together. • The ePortfolio demonstrates careful thought about the order in which information is presented, however the page layout appears to waste space or be too crowded.	• Design could be neater or might be inappropriate. • Page layouts are organized into paragraphs and/or sections. • The ePortfolio demonstrates careful thought about the order in which information is presented, however page layouts appears to waste space or be too crowded. Placement of graphics is confusing.	• Design is inappropriate. • Page layouts lack structure. • The ePortfolio demonstrates little thought about the order in which information is presented.
Navigation- is your ePortfolio easy to use?	• Major section headings are clear and easy to understand. Links are logical and easily followed. The page has return links to previous pages. Navigation points (buttons, text, images, etc.)	• Major section headings are clear and easy to understand. Links are logical and easily followed. The page has return links to previous pages. Navigation points (buttons, text, images, etc.)	• Links are not logical and navigation points (buttons, text, images, etc.) are unclear or confusing. No return link is provided. • Several links do not work.	• Links are not logical and navigation points are unclear or confusing. • Most links do not work

	are clear and easily to understand. • Multi-linked pages; all links work	are unclear or confusing. • A few links do not work		
Folder Structure- are your files properly stored? (minimum of 3 files)	• Files are stored in appropriate folders.	• Most files are stored in appropriate folders.	• Many files are stored in inappropriate folders.	• Files are stored randomly in unrelated folders.
	Proficient **5**	**Capable** **4**	**Basic** **2**	**Novice** **1**
Graphics- text and images are appropriately displayed and used. (Must have minimum of 3 images)	• Graphics enhance text; most images are student produced. • Graphics have proper size, resolution, colors, and cropping. • Background is subtle and does not make it difficult to view text or graphics. • Only free or original graphics used.	• Graphics have strong relation to text; some images are student produced. • The majority of the graphics have proper size, resolution, colors, and cropping. • Background is subtle and does not make it difficult to view text or graphics. • Only free or original graphics used.	• Graphics are unrelated to page or text; some images are student produced. • Graphics are poorly cropped or have color problems; graphics are too big or too small for page. • The background interferes with the reading of the text or viewing graphics. • Only free or original graphics used.	• Graphics are unrelated to page or text; too many graphics. • Graphics are of poor quality and confusing. • The background interferes with the reading of the text or viewing graphics. • Copyrighted graphics are used; no original graphics present.
Sounds- is/are your sound(s) appropriate? (must have at least 1)	• The sounds enhance the quality of the ePortfolio.	• Sounds are of high quality and are appropriate.	• Some sounds are inappropriate and/or distracting.	• Many sounds are inappropriate and/or distracting/ sound(s) do not exist.
Reflections- adequate, appropriate, and thoughtful self- assessments. (minimum of 3 reflections)	• All reflections include a detailed description of the activity and a detailed account of all skills learned. • All reflections include personal reactions that are descriptive and insightful. • Reflections are original and specific to the particular pieces.	• Most reflections include the description of the activity and the main skills learned. • Reflections include personal reaction that clearly reflect the student's feelings. • Reflections are original and specific to the particular pieces.	• Some reflections include the description of the activity and the main skills learned. • Some reflections include personal reactions. • Reflections may be vague or repetitive.	• Few reflections include the description of the activity and the main skills learned. • Few reflections include personal reactions. • Reflections are vague or repetitive.

Mechanics- makes sure you "spell check".	• There are very few to no errors in grammar, spelling and/ punctuation. • Site needs little or no editing.	• Errors in grammar, spelling and/ punctuation are minor and few. • Site needs some editing.	• Grammar, spelling and/ punctuation errors are evident, but do not interfere with communication. • Site needs much editing.	• Grammar, spelling and punctuation errors are distracting and interfere with communication. • Site needs extensive editing.
Theme- what character trait(s) are you trying to exude about yourself?	• Theme is apparent. Reflections, artifacts, support theme.	• Many of the reflections, artifacts, and other items support the theme.	• Some of the reflections, artifacts, and other items support the theme.	• The theme is not apparent. Many characteristics are present.
	Proficient 5	**Capable 4**	**Basic 2**	**Novice 1**
Content- are your documents (artifacts) relevant and appropriate?	• Documents are well selected for the audience and purpose. • Documents demonstrate attention to conventions and proofreading. • Where visual materials are included in these documents, they are appropriate and well done. • The overall effect of the portfolio suggests strong communication skills across a range of documents and genres. • And does so with attention to the number and kinds of documents the audience will expect.	• Most documents are well selected but some are inappropriate for the purpose and/or audience. • Occasional and minor errors within documents do not interfere with the message. • Visual materials within documents are appropriate but in some cases could be better handled. • The overall effect of the portfolio suggests good communication skills across a limited range of documents and/or genres. • The number and/or kinds of documents show inconsistent attention to audience.	• Some of the documents are appropriate for the audience and/or purpose, or there are either too few to gauge proficiency. • Some of the visual materials are not well handled. • The overall effect of the portfolio suggests concern about the student's communication skills or ability to move across a range of genres. • The number and kinds of documents suggest little awareness of the audience's expectations.	• None of the documents are appropriate for the audience and/or purpose and/there are too few to gauge proficiency or are inappropriate for a professional audience. • Visual materials are not well handled. • The overall effect of the portfolio creates some concern about the student's communication skills or ability to move across a range of genres. • The number and kinds of documents suggest no awareness of the audience's expectations.

9. <u>**Interpreting Results**</u>
SLO 1 – Carbohydrate, Lipid, and Protein Knowledge – Objective Course Exams
The comprehensive breakdown by nutrient was developed to allow for more in-depth assessment of specific components of the course across the three critical SLO elements of digestion, absorption, and metabolism of each nutrient. For 2017/2018 academic year, the students performed best in the areas of

digestion and absorption of the macronutrients. Similar results were obtained when the data was compared to the 2016/2017 and 2015/2016 academic year. Carbohydrate digestion scores were increased from last year (74.6% vs. 69.1%). There was a slight decrease in protein digestion and absorption scores in 2017/2018 compared to data from 2016/2017.

For metabolism, there was an increase in overall metabolism scores for the macronutrients in 2017/2018 compared to 2016/2017 (69.9% vs. 63.8%). Scores for protein, carbohydrate and lipid metabolism were increased this year compared to 2016/2017 with the biggest increase in protein metabolism (75.4% vs. 63.8%). Historically, students perform better on protein metabolism compared to carbohydrate and lipid metabolism knowledge.

Some of the results obtained above can be explained with changes in the course instruction and subject matter. A possible reason for the decrease in protein digestion and absorption this year may have been due to the professor being out of town during the protein digestion and absorption lectures. A PhD student was responsible for this lecture material. Improvement in the metabolism scores was most likely due to a different instructional strategy. This course was moved to an active learning classroom in the Mell classroom building. The instructor incorporated more active learning teaching techniques during the course. In particular, there was more of a focus on case study analysis during class time which is mainly centered on metabolism. It appears this helped with student retention of the material and thus better scores of these questions during the exams.

Active learning will continued to be used in the course for the next academic year.

SLO 2 – Vitamins and Minerals Knowledge - Pre-test/post-test
Based on the results, NSPM students improved their knowledge regarding vitamin and mineral concepts during NTRI 4830 (Vitamins and Minerals). Overall, for vitamin and mineral knowledge, there was an increase from 5% to 48.5% for all questions for the pre-test/post-test results. Both vitamin and mineral knowledge increased for the NSPM students. There was an increase from 4% to 35% for vitamin knowledge and an increase from 2% to 62% for mineral knowledge. Based on these results, students did much better on the mineral questions compared to the vitamin questions. Similar results were obtained in the 2016/2017 academic year. It was thought that the reason for this discrepancy between vitamin and mineral knowledge was due to the fact that the post-test was given at the end of the semester and therefore the minerals knowledge would be more recently retained since the minerals are covered in the last half of the class. This year, the instructor gave the vitamins post-test after the vitamins material was completed. There was an increase in the vitamin scores compared to last year (35% vs. 18.2%), however, it is still lower than expected. This topic will be discussed at this year's assessment meeting to try and determine alternative approaches to this issue.

For assessment purposes, the pre-test/post-test that was administered this year was not broken down into specific components of the student learning objective (digestion, absorption and metabolism). The instrument will be improved for next year's assessment to include these components. This will allow for a better understanding of where deficiencies in student learning are occurring.

SLO 3 – Life-cycle growth chart project
Overall, the NSPM students did well on this assignment. The overall average was 92.0%. This was the first year for this assignment so there is no historical data to compare. Students performed well on completing the required tables and selecting and completing the required growth charts (90.7-100%). The students scored lowest on the interpretation section (87%). This requires the students to assess and synthesize the given information to determine which growth curve corresponds to a possible situation or condition (examples are differentiating between growth hormone deficiency and infantile

obesity). Based on this information, the instructor will spend more class time discussion on helping students in being able to distinguish specific conditions using charts and tables. The assessment coordinator has suggested that an active learning exercise may be appropriate for this topic.

SLO 4 – Evaluation Writing Assignment
Overall, the NSPM students did well on this assignment. The overall average was >90%. Historical data from the past two years is provided in the summary rubric. Results from this year are consistent with the previous two years. The greatest area of improvement from 2017 to 2018 was the Main text section in which results from the articles were reported. An area for concern is the lower scores in the Summary section. Based on the scores for the Summary section, the instructor will emphasize the necessity for a proper Summary when he verbally describes the assignment to the class. Overall the instructor is pleased that the students are effective in professional written communication on dietary approaches to disease prevention and/or treatment.

SLO 6 – Nutritional Genomics Knowledge – Pre-test/Post-test
This was the first year for using a pre-test/post-test instrument for assessment in this course. Overall, assessed through questions on a pre-test/post-test, NSPM students improved nutritional genomics knowledge. The average score for the pre-test was 53%. The average score for the post-test was 86%. The scores on the pre-test were higher than expected. In comparison, NTDX (dietetics) students average score on the pre-test was 36%. Some of the concepts in nutritional genomics are similar to what students learn in a general genetics class (and some biology courses). The NSPM students take genetics in their junior year. This is the most likely explanation for the higher than expected scores on the pre-test. The questions that had the highest correct scores on the pre-test were in the area of basic genomic knowledge which would have most likely been covered in a genetics course.

Question #2 did not show any improvement from the pre-test to the post-test. This questions is focused on chromosomal structure. In this course, students typically have difficulty with chromosomal structural concepts, especially as it relates to recognizing DNA sequences typical of these structures. The instructor will focus more in-class discussion on structural aspects related to chromosomes. This is important because these structures can impact gene regulation and disease risk associated with aging and cancer.

Based on these results, the instructor will modify the pre-test/post-test instrument to better reflect concepts specific for this course for next year's assessment.

SLO 7 – Professional Development - ePortfolio Project
This was the first year for using this instrument for assessment for professional development. Overall, the NSPM students did well on this assignment. The overall average was 89.2%. Students performed weakest in the criteria of folder structure (6.7/10), sounds (8.4/10) and reflection (7.6/10). In analyzing the scores, students missed points for the folder section because they did not provide the appropriate files based on educational or professional experiences or the files were not located in the appropriate places in the ePortfolio. Points were missed for the sound criteria mainly because students failed to upload sound files for the ePortfolio. The reflection section requires students detailed description of their experiences and a detailed accounting of skills learned and what insights they took away from these experiences. Students mostly missed points for failing to describe what these experiences meant to them and how this will help them in their future careers.

The instructor will provide better instruction on detailing instructions in terms of correct files to upload and where they need to be place in the ePortfolio as well as emphasizing sounds are required for the project. These instructions will be emphasized during in-class discussion for this project. The instructor

will also provide more emphasis on what is required in the reflections section. An example will be provided as a guide for students.

10. **Communicating Results**

Outcomes are shared with the nutrition faculty via email and discussed at faculty meetings dedicated for assessment results. Rubrics for course assignments are shared with students to provide feedback for improving their performance. Outcomes will also be shared with an NSPM sub-committee from our Nutrition and Dietetics Advisory Board as well as with a newly formed NSPM undergraduate student focus group.

Use of Results

11. **Purposeful Reflection and Action Plan**

Overall, assessment data show NSPM students are improving their knowledge within each of the SLOs assessed for the 2017/2018 academic year. Within each SLO, sub-content areas have been identified where attention is needed for improvement. The NSPM assessment coordinator has met with each instructor and has discussed where improvement is needed in either course content, delivery or assessment practices to aid in improvement in these areas.

Based on the results from this year's assessment, an action plan has been formulated to improve NSPM student assessment. The following actions will be taken foe this year:

- meet with faculty to review and discuss this year's assessment. Institute any changes needed to improve assessment as outlined in this document based on 2017/2018 assessment results.

- develop pre-test/post-test instrument for SLO 5 for NTRI 4820 and NTRI 4830 courses.

- review assessment with NSPM undergraduate student focus group with an emphasis on assignments and projects in courses and how they can be improved.

- review assessment results with NSPM subcommittee from our Nutrition and Dietetics Advisory Board with an emphasis on how the assessment practices are impacting student preparation for acceptance into professional schools.

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