

**NUTC 0204: Underlying Causes of Malnutrition
Spring 2023**

Class Meetings: Online

Instructor: Heather Stobaugh, PhD
Email: Heather.Stobaugh@tufts.edu
Skype: Heather.Stobaugh
Office hours: Skype Meeting by Appointment

Semester Hour Units: 3 semester hour units

Course Description: This course will analyze the various nutrition-sensitive programs aimed at addressing underlying determinants of malnutrition. These underlying determinants are commonly classified as: food insecurity, poor care practices for women and children, limited access to and use of health services, unsafe water and poor sanitation. Emphasis will be on exploring the current evidence on how these factors lead to malnutrition and the implications for designing nutrition-sensitive programs to address such determinants. Nutrition-sensitive approaches discussed in this class include: agriculture, food security, early childhood development, education, gender and women's empowerment, water and sanitation, health systems, social safety nets and poverty alleviation.

Course Objectives: At the end of the course, students will be able to differentiate between nutrition-specific and nutrition-sensitive programs; summarize the strength of the evidence around the causal pathways between underlying determinants and malnutrition; explain the opportunities and challenges in the design and implementation of nutrition-sensitive interventions that address the underlying causes of malnutrition; debate various modalities and pathways for improving nutrition other than nutrition-specific interventions; determine how nutrition-sensitive programs can integrate and promote nutrition as a goal of multiple sectors.

Texts or Materials: Reading and other materials for this course span a variety of research articles, policy briefs, systematic reviews, short videos, program design guidebooks, and more. All materials will be made available online.

Academic Conduct: Each student is responsible for upholding the highest standards of academic integrity, as specified in the Friedman School's Policies and Procedures manual (<http://nutrition.tufts.edu/student/documents>) and Tufts University policies ([http://uss.tufts.edu/studentaffairs/judicialaffairs/Academic Integrity.pdf](http://uss.tufts.edu/studentaffairs/judicialaffairs/Academic%20Integrity.pdf)). It is the responsibility of each student to understand and comply with these standards, as violations will be sanctioned by penalties ranging from failure on an assignment and the course to dismissal from the school.

Communication: The instructors are available to meet with students by scheduling a Skype meeting via email. Students may also email instructions with questions directly. You will receive email replies within 48 hours (excluding weekends). Please do not expect instant replies. Also feel free to contact other classmates for help on assignments or if you have questions.

Assessment and Grading:

<i>Assignment</i>	<i>Learning Objectives</i>	<i>Grading weight</i>
<i>10 Discussion Board Posts</i>	<i>Varied/All</i>	<i>20%</i>
<i>CTP vs. In-Kind Intervention</i>	<i>3.1 - 4.3</i>	<i>15%</i>
<i>Brief (WASH)</i>	<i>6.1 - 6.2</i>	<i>15%</i>
<i>Nutrition-sensitizing a Program (School Meals)</i>	<i>10.1 - 10.2</i>	<i>15%</i>
<i>Theory of Change</i>	<i>12.1 - 12.2</i>	<i>35%</i>

Instructions for Submission of Assignments and Exams: Assignments received after their deadline will not be accepted or graded unless extension is approved in advance. Students who are unable to complete an assignment exam on time for any reason should notify the instructor by email prior to the deadline, with a brief explanation for why the extension is needed.

Detailed instructions for each assignment (under each week) can be found on the [Canvas](#) course site under the respective Module.

Online Discussion Board: Students are expected to participate regularly in online discussions throughout the course. Each week, 1-2 thought-provoking questions will be posted, for which the responses will require the application of concepts and facts presented in the lectures and readings. Students will be expected to post a 'lead post', which directly answers the posed question and a 'response post' that directly addresses another student's post. The posts should deepen the nature of the class discussion by introducing unique ideas and insights, raising questions, and articulating opinions. Repeating other students' statements will not suffice as posting original content. Responses may cite outside readings, respectfully challenge other's viewpoints, raise questions, and tactfully debate often challenging or even controversial topics. This online interaction is meant to emulate a discussion that would otherwise take place in-person in a traditional classroom.

Each week, a discussion board topic will be posted onto [Canvas](#) by Sunday at midnight, (by 11:59pm EST). Please write an initial response to the discussion board by the following Friday of that particular week before midnight (by 11:59pm EST). Unless otherwise specified, the questions will generally require a 350-500 word response for lead posts. This is a great place to raise a question for other classmates to respond to. Then, read through your classmates' lead posts and reply to at least two of your classmates by Sunday at midnight (by 11:59 EST) of each of the aforementioned weeks. This allows for two days to read the initial responses for which to reply. The exception to this will be Week 1's post, which will only require an initial post without required responses to classmates (although it is encouraged), due to Week 1 being a shortened week.

Each week, the discussion posts will be graded based on the rubric below. Students are expected to post on the discussion board for 10 out of the 13 weeks. If students post more than 10 times, the three lowest graded posts will be dropped from their grade. At the end of the course, the discussion board posts will be averaged to account for 20% of the total course grade.

Rubric for online posts

Criteria	Ratings			Pts
Relevance of Response	3.0 pts Expected Level of Competence <i>Response is concise, clear and thoughtful. Response contributes something original or builds upon what has been said; it is not repetitious.</i>	1-2.0 pts Moving Towards Expected Level of Competence <i>Response is related to the discussion posts, but only addresses peripheral issues. Repetition of questions or points made by others.</i>	0.0 pts Below Expected Level of Competence <i>Responses do not relate to the discussion posts. Makes, short, irrelevant remarks or responds with minimum effort.</i>	3.0 pts
Timeliness of Contributions	3.0 pts Expected Level of Competence <i>This response contributes constructively to the discussion post.</i>	1-2.0 pts Moving Towards Expected Level of Competence <i>This post is late.</i>	0.0 pts Below Expected Level of Competence <i>Does not read messages in discussion area and does not contribute constructively to the discussion.</i>	3.0 pts
Interaction with others	3.0 pts Expected Level of Competence <i>Responds to other posts; stimulates discussion; encourages a variety of viewpoints. Disagreements are expressed respectfully.</i>	1-2.0 pts Moving Toward Expected Level of Confidence <i>Participation is evident, posts may acknowledge others posts, but does not elaborate on any agreement/ disagreement with others or the original post..</i>	0.0 pts Below Expected Level of Competence <i>Has not raised questions to stimulate discussion and has not responded to the questions comments raised by others. Comments are unconstructive or non-courteous.</i>	3.0 pts

Accommodation of Disabilities: Tufts University is committed to providing equal access and support to all students through the provision of reasonable accommodations so that each student may access their curricula and achieve their personal and academic potential. If you have a disability that requires reasonable accommodations please contact the Friedman School Assistant Dean of Student Affairs at 617-636-6719 to make arrangements for determination of appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

Technical Support for Online Courses and Programs:

Online course support is provided by Friedman support staff and/or IT Support. Please do not contact course instructors or the TAs for technical support.

- Telephone: (617) 627-3376
- Email: it@tufts.edu
- Hours: 24 hours a day, seven days a week.

When reporting a problem, please include:

- The name and number of your course (e.g., "NUTC 204")
- Your operating system and browser
- A detailed description of the problem

This information will expedite the troubleshooting process. If you are sending a support request via email, please use your Tufts email address.

Course Topics and Assignment Schedule at a Glance:

This schedule is subject to modification at the instructor's discretion.

<u>Week</u>	<u>Topic</u>	<u>Assignment</u>
1	Underlying Causes of Malnutrition	Post on Discussion Board
2	Theory behind nutrition-sensitive interventions	Post on Discussion Board
3	Food-based interventions	Post on Discussion Board
4	Cash and voucher interventions	Post on Discussion Board
5	Nutrition-sensitive agriculture, Gender, Women's Empowerment	Post on Discussion Board **Cash/Voucher versus In-kind transfer
6	Water, Sanitation, and Hygiene	Post on Discussion Board
7	Environmental Enteric Dysfunction and the Gut Microbiome	Post on Discussion Board
8	Health	Post on Discussion Board **Policy Brief: Evidence behind WASH and Nutrition
9	Seasonality	Post on Discussion Board
10	School-based Programs and Early Childhood Development	Post on Discussion Board
11	Social Protection, Gender, and Family Planning	Post on Discussion Board **Adapt current program design to be nutrition sensitive
12	Theory of Change and Nutrition-Sensitive Program Design	Post on Discussion Board
13	Multi-Sectoral Approaches and Sustainable Development Goals	Post on Discussion Board **Theory of change model and program concept note

Detailed Description of Course Topics, Assignment Schedule, and the Learning Objectives for Each Class Session:

Week 1:

The types of malnutrition and the causes of malnutrition – Unpacking the causal framework

Learning Objectives:

Upon completion of this week, students will be able to:

- 1.1 Differentiate between the different types of malnutrition.
- 1.2 Identify the underlying and basic causes of malnutrition.
- 1.3 Review the different interventions, policies, and programs that could address the various causes of malnutrition.

Readings:

- UNICEF (1992) *Strategy for Improved Nutrition of Children and Women in Developing Countries*. United Nations Children's Fund, New York, NY, USA. (****Read pp 19-23 and 31-36**)
- Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J, the Maternal and Child Nutrition Study Group. (2008) Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet*, 371: 243-60. (****Only need to familiarize yourself with Figure 1 on p244**)
- Black RE., Morris SS and Bryce J. (2003) "Where and why are 10 million children dying every year?" *Lancet*, 361: 2226–34.
- Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, Ezzati M, Grantham-McGregor S, Katz J, Martorell R, Uauy R, and the Maternal and Child Nutrition Study Group (2013) "Maternal and child undernutrition and overweight in low-income and middle-income countries" *Lancet* 382: 427–51.

Assignments:

- Discussion board post (L.O. 1.1 – 1.2)

Week 2:

Nutrition-sensitive interventions: what exactly are they?

Learning Objectives:

Upon completion of this week, students will be able to:

- 2.1 Differentiate between nutrition-sensitive and nutrition specific interventions.
- 2.2 Analyze the theory behind nutrition-sensitive interventions.
- 2.3 Defend the need for long-term vision, cross-sectoral and multi-sectoral programming, and commitment to combat malnutrition

Readings:

- Alderman H and Ruel M (2013) "Nutrition-sensitive Interventions and Programmes: How Can They Help to Accelerate Progress in Improving Maternal and Child Nutrition?" *Lancet*, 382: 536-551.
- ENN (2016) *Field Exchange: Special Focus on Nutrition-Sensitive Interventions* Issue 51, January 2016. Emergency Nutrition Network, UK. (****Read Editorial on pp 1-7, review a few of the case studies as examples of nutrition-sensitive programs**)
- Arnold T. (2016) "Nutrition-Specific and Nutrition-Sensitive Interventions" Chapter 5.4 In: Eggersdorfer M, Kraemer K, Cordaro JB, Fanzo J, Gibney M, Kennedy E, Labrique A, Steffen J. *Good Nutrition: Perspectives for the 21st Century*. Basel, Karger, pp 276–288. Available online at: <https://www.karger.com/Article/Pdf/452392>.

Optional Reading:

- Bhutta ZA, Das JK, Rizvi R, Gaffey M, Walker N, Horton S, Webb P, Lartey A, Black RE, The Lancet Nutrition Interventions Review Group, and the Maternal and Child Nutrition Study Group (2013) "Evidence Based Interventions for Improving Maternal and Child Nutrition: What Can be Done and at What Cost?" *Lancet*, 382: 452–77.

Assignment:

- Discussion board post (L.O. 2.1 – 2.2)

Week 3:

Food-based interventions (food distributions, preventive RUFs, MNPs, etc.)

Learning Objectives:

Upon completion of this week, students will be able to:

- 3.1 Describe the different types of food-based interventions.
- 3.2 Compare examples and analyze strengths and weaknesses of food based nutrition interventions.
- 3.3 Summarize the theoretical concepts for how food based interventions can affect nutritional status.

Readings:

- Webb P, Roberts BL, Rosenberg IH, Schlossman N, Wanke C, Bagriansky J, Sadler K, Johnson Q, Tilahun J, Masterson A, et al (2011). Improving the Nutritional Quality of U.S. Food Aid: Recommendations for Changes to Products and Programs. Boston, MA: Tufts University. (****Introduction pp9-17 and Appendix 1 pp164-168**)
- Carmel Dolan and Jeremy Shoham (2014). The effectiveness of blanket supplementary feeding programmes in preventing acute malnutrition. Evidence from research carried out in Chad: ENN Briefing Paper.
- Thompson B and Amoroso L (Eds) (2014) Improving Diets and Nutrition: Food-Based Approaches. FAO and CABI. (****Chapters 4, 7, and 13**).

Assignment:

- Discussion board post (L.O. 3.2)

Week 4:

Cash and voucher interventions (cash, vouchers, market-based interventions)

Learning Objectives:

Upon completion of this week, students will be able to:

- 4.1 Explain how cash-based interventions benefit nutrition and health.
- 4.2 Summarize the principles of cash-based interventions.
- 4.3 Debate cash-based interventions vs. food-based interventions in emergencies.

Readings:

- Bailey S and Hedlund K (2012) *The impact of cash transfers on nutrition in emergency and transitional contexts - A review of evidence*. Overseas Development Institute, London, UK.
- Harvey P and Bailey, S. (2011) *Cash transfer programming in emergencies – Good Practice Review 11*. Humanitarian Practice Network. ODI.
- Trenouth L, Powel J and Pietzsch S. (2009). Fresh food vouchers for refugees in Kenya. Field Exchange 36, July 2009. p19. www.enonline.net/fex/36/fresh
- Fenn, B. (2017). [Impacts of cash on nutrition outcomes. From available scientific evidence to informed action](#). R4ACT.

Assignment:

- Discussion board post (L.O. 4.1-4.3)
- Brief: Cash-based transfer vs. in-kind assistance (L.O. 3.1-4.3)

Week 5:

Nutrition-sensitive agriculture (extension services, seeds & tools, home gardens, etc.)

Learning Objectives:

Upon completion of this week, students will be able to:

- 5.1 Explain the theoretical relationship between agriculture and nutrition outcomes
- 5.2 Describe the various types of agriculture-based interventions.
- 5.3 Recommend types of agriculture-based interventions based on context, evidence, desired nutrition outcomes.

Readings:

- Pingali P and Sunder N (2017) Transitioning Toward Nutrition-Sensitive Food Systems in Developing Countries *Annual Review of Resource Economics*. 9:4.1-4.20.
- FAO (2015) *Designing nutrition-sensitive agriculture investments: Checklist and guidance for programme formulation*. FAO, Rome.
- Webb P, Kennedy E. Impacts of agriculture on nutrition: nature of the evidence and research gaps. *Food Nutr Bull* 2014;35(1):126-32.

Assignment:

- Discussion board post (L.O. 5.2 - 5.3)

Week 6:

WASH interventions (water, sanitation, and hygiene)

Learning Objectives:

Upon completion of this week, students will be able to:

- 6.1 Assess how WASH can affect nutritional status.
- 6.2 Explain the impact of WASH interventions on nutritional status.
- 6.3 Compare innovative programs that address the sanitation and hygiene situation of under 2s.

Readings:

- WHO, UNICEF, USAID. (2015) *Improving Nutrition Outcomes with Better Water, Sanitation and Hygiene: Practical Solutions for Policies and Programmes*. WHO.
- USAID. (2015) *WASH & Nutrition: Water and Development Strategy Implementation Brief*. USAID.
- Humphrey JH, Mbuya MNN, Ntozini R, et al. Independent and combined effects of improved water, sanitation, and hygiene, and improved complementary feeding, on child stunting and anaemia in rural Zimbabwe: a cluster-randomised trial. *Lancet Glob Health*. 2018;7(1):e132-e147.

Assignment:

- Discussion Board Post (L.O. 6.1 - 6.3)
- Brief: Evidence Behind WASH and Nutrition (L.O. 6.1 – 6.2)

Week 7:

Environmental Enteric Dysfunction (EED) and the gut microbiome

Learning Objectives:

Upon completion of this week, students will be able to:

- 7.1 Explain the hypothesized role that EED plays in malnutrition
- 7.2 Discuss the challenges and gaps in knowledge around measuring EED
- 7.3 Summarize how linkages between gut microbiome and nutritional status

Readings:

- Ngunjiri FM, Reid BM, Humphrey JH, Mbuya MN, Pelto G, Stoltzfus RJ. (2014) Water, sanitation, and hygiene (WASH), environmental enteropathy, nutrition, and early child development: making the links. *Annals of the New York Academy of Sciences* 1308(1):118-28.
- Harper KM, Mutasa M, Prendergast AJ, Humphrey J, Manges AR. Environmental enteric dysfunction pathways and child stunting: A systematic review. *PLOS Neglected Tropical Diseases* 2018;12(1): e0006205. doi: 10.1371/journal.pntd.0006205.
- Kane AV, Dinh DM, Ward HD. Childhood Malnutrition and the Intestinal Microbiome Malnutrition and the microbiome. *Pediatric research* 2015;77(0):256-62. doi: 10.1038/pr.2014.179.

Assignment:

- Discussion Board Post (L.O. 7.2 – 7.3)
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Week 8:**Health interventions****Learning Objectives:**

Upon completion of this week, students will be able to:

- 8.1 Explain at least two biological causal pathways between health and nutrition status.
- 8.2 Discuss the conceptual theory around health interventions and nutritional status.
- 8.3 Critique an example of health interventions and policies on how well they might impact nutrition status.

Readings:

- GAVI Alliance. (2013) Immunisation and Nutrition: An integrated approach for saving lives.
- Rytter MJH, Kolte L, Briend A, Friis H, Christensen VB. The Immune System in Children with Malnutrition—A Systematic Review. PLoS ONE 2014;9(8):e105017. (****Skim for general understanding**)
- Patel LN, Detjen AK. Integration of childhood TB into guidelines for the management of acute malnutrition in high burden countries. Public Health Action 2017;7(2):110-5.
- Cichon B, Fabiansen C, Yaméogo CW, Rytter MJH, Ritz C, Briend A, Christensen VB, Michaelsen KF, Oummani R, Filteau S, et al. Children with moderate acute malnutrition have inflammation not explained by maternal reports of illness and clinical symptoms: a cross-sectional study in Burkina Faso. BMC Nutrition 2016;2(1):57.

Assignment:

- Discussion board post (L.O. 8.3)

Week 9:**Seasonality****Learning Objectives:**

Upon completion of this class, students will be able to:

- 9.1 Discuss how factors of seasonality impact malnutrition
- 9.2 Compare the UNICEF causal framework for malnutrition with the adapted one considering seasonality.

Readings

- Chambers R. Seasonality, Poverty, and Nutrition: A Professional Frontier. EFNAG National Workshop on Poverty and Malnutrition; Tamil Nadu Agricultural University, Coimbatore; 1983.

- Young H. Nutrition in Africa's drylands: A conceptual framework for addressing acute malnutrition. Feinstein International Center, Tufts University; 2020.
- Marshak A., Luc, G., Radday, A., and H. Young. Seasonality matters: how cyclical changes trigger drivers of acute malnutrition in Chad's Sila Province. Feinstein International Center, Tufts University 2020.

Assignment

- Discussion board post (L.O. 9.1 – 9.2)

Week 10:

School-based programs (school meals, food for education, academic achievement)

Learning Objectives:

Upon completion of this week, students will be able to:

- 10.1 Summarize the concepts of food-for-education.
- 10.2 Compare the objectives of different types of school-based interventions and assess the strengths and weaknesses of objectives that relate to nutrition outcomes.
- 10.3 Debate whether school-feeding programs are nutrition-sensitive or nutrition-specific.

Readings:

- Bundy D, Burbano C, Grosh M, Gelli A, Jukes Matthew, Drake L (2009) *Rethinking School Feeding Social Safety Nets, Child Development, and the Education Sector*. Directions in Development. World Bank.
- Jomaa LH, McDonnell E, Probart C (2011) "School feeding programs in developing countries: impacts on children's health and educational outcomes." *Nutrition Reviews* 69(2):83-98.
- Watkins KL, Gelli A, Hamdani S, Masset E, Mersch C, Nadazdin N, Vanhees J (2015) *Sensitive to nutrition? A literature review of school feeding effects in the child development lifecycle* HGSF Working Paper Series #16, HGSF PCD, London.

Optional Reading:

- WFP (2013) "Revised School Feeding Policy" Policy Issues. Executive Board Second Regular Session, 4-7 November 2013. WFP, Rome.

Assignment:

- Discussion board post (L.O. 10.3)
- Program Design Concept Note: Incorporating nutrition into program design (L.O. 10.1-10.2)

Week 11:

Social Protection, Gender, and Family Planning

Learning Objectives:

Upon completion of this week, students will be able to:

- 11.1 Describe how social protection programmes hold the potential for sustainable improvements in nutrition outcomes.
- 11.2 Explain the conceptual theory around gender and women's empowerment interventions and nutritional status.
- 11.3 Summarize the evidence behind family planning and the impact on nutrition status

Readings:

- FAO (2015) Nutrition and Social Protection. Food and Agriculture Organization of the United Nations, Rome.
- Alderman H (2015) Leveraging Social Protection Programs for Improved Nutrition *Summary of Evidence Prepared for the Global Forum on Nutrition-Sensitive Social Protection Programs*. The World Bank, Washington DC.
- FAO (2012) "Gender and nutrition" *Issue Paper*, Food and Agriculture Organization of the United Nations, Rome.
- Rutstein S and Winter R. The Effects of Fertility Behavior on Child Survival and Child Nutritional Status: Evidence from the Demographic and Health Surveys, 2006 to 2012; DHS Analytical Studies No. 37. 2014.

Optional Reading:

- Leão MM, Maluf RS (2012) *Effective Public Policies and Active Citizenship: Brazil's experience of building a Food and Nutrition Security System* Abrandh and Oxfam, Brazilia.
- Maximizing synergies between maternal, infant, and young child nutrition and family planning. 2012.

Assignment:

- Discussion board post (L.O. 11.3)

Week 12:

Theory of Change and Nutrition-Sensitive Program Design

Learning Objectives:

Upon completion of this week, students will be able to:

- 12.1 Explain the process of evaluating programs for impact on nutrition outcomes.
- 12.2 Discuss common indicators used for nutrition-sensitive interventions.
- 12.3 Explain the benefits of a theory of change in program development

Readings:

- Herforth A, Ballard TJ. Nutrition indicators in agriculture projects: Current measurement, priorities, and gaps. *Global Food Security* 2016;10 (Supplement C):1-10.
- Leroy, Jef L.; Olney, Deanna K.; and Ruel, Marie T. 2016. Evaluating nutrition-sensitive programs: challenges, methods, and opportunities. In *Achieving a nutrition revolution for Africa: The road to healthier diets and optimal nutrition*. Covic, Namukolo and Hendriks, Sheryl L. (Eds.). Chapter 10. Pp. 130-146. Washington, D.C.: International Food Policy Research Institute (IFPRI). http://dx.doi.org/10.2499/9780896295933_10

Optional:

- FAO (2016) *Compendium of indicators for nutrition-sensitive agriculture*. Food and Agriculture Organization of the United Nations, Rome. (**Good reference to for nutrition-sensitive indicators)

Assignment:

- Discussion board post (L.O. 12.1)
- Theory of Change and Concept Note (L.O. 12.2-12.3)

Week 13:**Sustainable Development Goals and multi-sectoral approaches****Learning Objectives:**

Upon completion of this week, students will be able to:

- 13.1 Analyze the synergies in working multi-sectorally in nutrition.
- 13.2 Explain the role of political commitment in long-term pathways leading to improving nutrition.
- 13.3 Assess different national-level policies to combat malnutrition by addressing underlying causes of malnutrition.
- 13.4 Identify the main factors of success for these policies.

Readings:

- Mucha N (2012) "Implementing Nutrition-Sensitive Development: Reaching Consensus". Briefing Paper, Number 20, November 2012, Bread for the World.
- Gillespie S, Haddad L, Mannar V, Menon P, Nisbett N, and the Maternal and Child Nutrition Study Group (2013) "The politics of reducing malnutrition: building commitment and accelerating progress" *Lancet* 382: 552–69.
- World Bank (2013) *Improving Nutrition Through Multi-sectoral Approaches – Report*. The World Bank, Washington, DC.
- Webb P, Luo H, Gentilini U (2015) "Measuring multiple facets of malnutrition simultaneously: the missing link in setting nutrition targets and policymaking." *Food Sec.* DOI 10.1007/s12571-015-0450-0 (open access at Springerlink.com).

Assignment:

- Discussion board post (L.O. 13.3 – 13.4)