LAU
الجامعة اللبنانية الأميركية
Lebanese American University

Faculty Fellows Program Summer 2024

Course Redesign

Flipped Classroom Approach

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Assistant Professor of Nutrition

NUT602
Research Methods
in Nutrition and Food Science

Graduate Course

MS in Nutrition

2 cr.

Fall 2023

Week	Date	Location	Lecture/activity
	Pre-course		**Test**: *Critical thinking pre-course test* **Interview [online]**: *How to work with criticism* **Activity**: *Analyze a published nutrition research article*
1	Sept 1	**Beirut**	**Introduction** **Discussion**: *The research process* **Lecture**: *Nutrition research* **Lecture**: *Literature search*
2	Sep 8	**Byblos**	**Lecture**: *Literature search (ctnd)* **Lecture**: *Research question* **Activity**: *Formulating and reflecting on a research question* **Discussion**: *Focusing a peer's research question*
3	Sep 15	**Beirut**	**Lecture**: *Nutrition studies*
4	Sept 22	**Byblos**	**Lecture**: *Nutrition studies* **Interview [online]**: *Population-based studies* [Professor Pascale Salameh]
5	Sept 29	**Beirut**	**Lecture**: *Nutrition studies (ctnd)* **Interview [online]**: *Intervention studies* [Dr. Mirey Karavetian]
6	Oct 6	**Byblos**	**Lecture**: *Bias in research* **Article discussion [Jigsaw method]**: *Definitions of bias in clinical research* **Lecture**: *Inclusion/Exclusion criteria*
7	Oct 13	**Beirut**	**Flipped classroom**: *Introduction to data analysis- Key concepts* **Lecture**: *Methods of data analysis*
8	Oct 20	**Byblos**	**Discussion**: *STROBE & CONSORT checklists* **Assignment**: *STROBE & CONSORT checklists* **Lecture**: *Ethics in research* **Interview [online]**: *Ethics in nutrition research* [Dr. Joseph Stephan] **Additional reading**: *The Poehlman case: running away from the truth* **Lecture**: *Grant Writing* **Interview [online]**: *Grant Writing* [Professor Maha Hoteit]
9	Oct 27		Deadline to submit the Peer teaching draft material
10	Nov 3		Deadline to submit the Assignment
11	Nov 10		Deadline to submit the Peer teaching material
12	Nov 17	**Byblos**	**Peer teaching**: *Methods to determine dietary intake- Part 1: Challenges, traditional and innovative methods* **Peer teaching**: *Methods to determine dietary intake- Part 2: Measurements errors, multivariate analyses, and dietary intakes methods*
13	Nov 24	**Beirut**	**Peer teaching**: *Methods to assess nutritional status and body composition* **Peer teaching**: *Energy expenditure and intake methods*
14	Dec 1	**Byblos**	**Guest speaker**: *Animal research* [Dr. Sama Sleiman] **Guest speaker**: *Chromatography in research* [Dr. Robin Taleb]
15	Dec 8	**Beirut**	**Interview [online]**: *Research in food science* [Dr. Hussein Hassan] **Discussion**: *Critical thinking post-course test* **Course wrap-up**

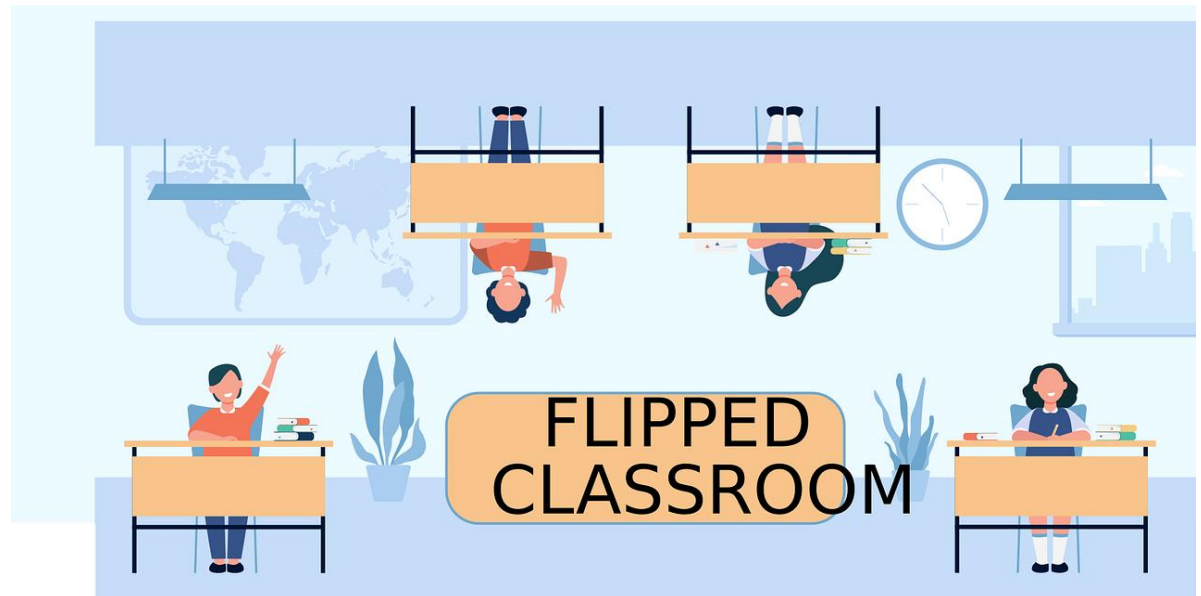
CIL team

Course Redesign

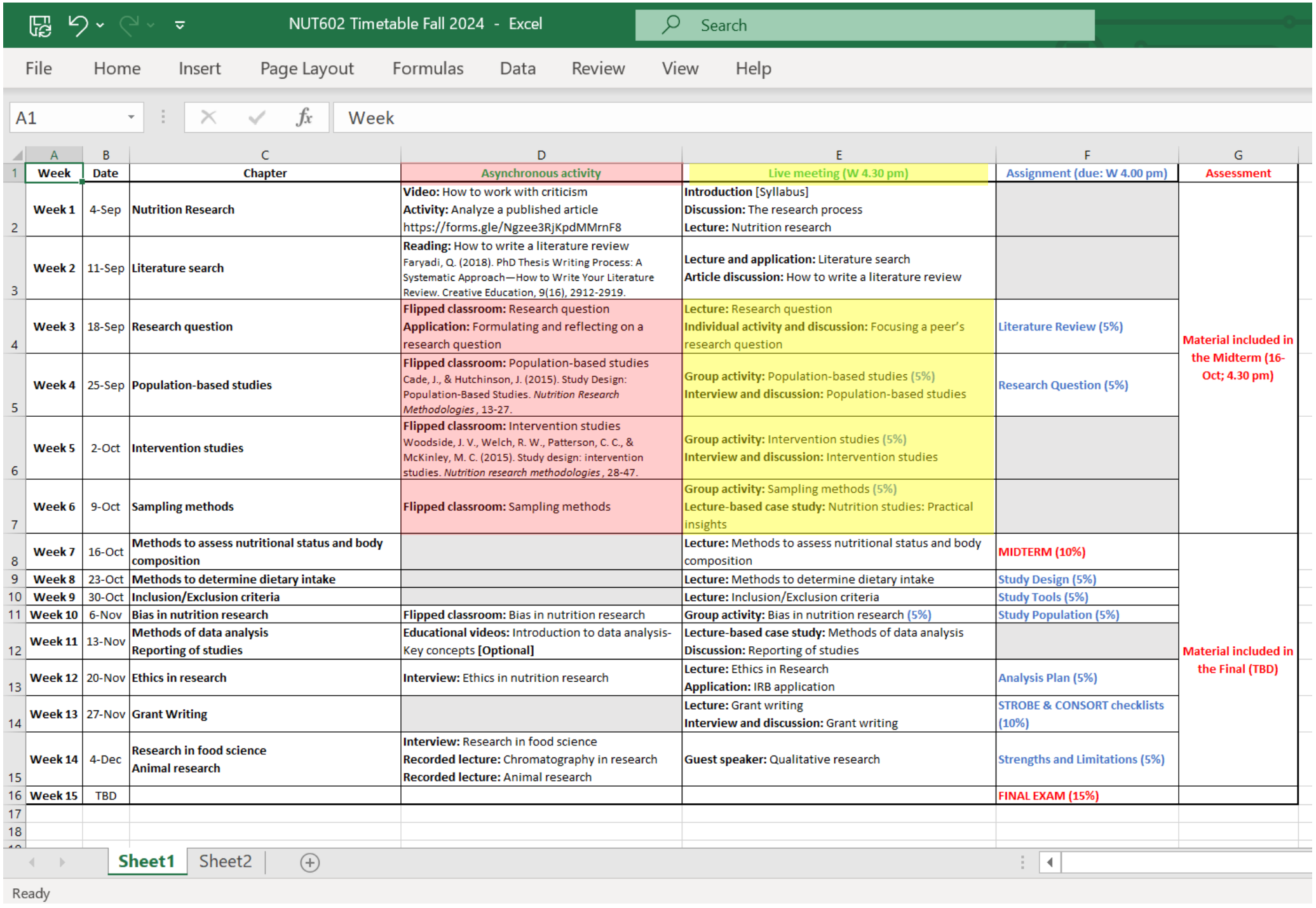
Tatiana Chaiban

Fall 2024

Week	Date/Location	Lecture/activity
Pre-course		**Video:** *How to work with criticism* **Activity (Perusall):** *Analyze a published nutrition research article*
1	Sept 4 NH216	**Introduction [Syllabus]** **Discussion:** *The research process* **Lecture:** *Nutrition research*
2	Sept 09 NH406	**Library session:** *Literature search [laptop needed]*
	Sept 11 NH216	**Application:** *Literature search [laptop needed]* **Reading:** *How to write an introduction*[1] **Recap & Application:** *Critique of Introduction sections of published articles* [1]Bahadoran, Z., Jeddi, S., Mirmiran, P., & Ghasemi, A. (2018). The principles of biomedical scientific writing: Introduction. *International Journal of Endocrinology and Metabolism, 16*(4), e84795.
3	Sept 18 NH216	***Deadline to submit the Introduction*** **Flipped classroom:** *Research question* **Application:** *Formulating and reflecting on a research question* **Lecture:** *Research question* **Activity & Discussion:** *Focusing a research question*
4	Sept 25 FMIC	***Deadline to submit the Research Question*** **Flipped classroom:** *Population-based studies*[2] **Recap & Group activity:** *Population-based studies* **Interview:** *Population-based studies* [P. Pascale Salameh] [2]Cade, J., & Hutchinson, J. (2015). Study Design: Population-Based Studies. *Nutrition Research Methodologies*, 13-27.
5	Oct 2 FMIC	**Flipped classroom:** *Intervention studies*[3] **Recap & Group activity:** *Intervention studies* **Interview:** *Intervention studies* [Dr. Mirey Karavetian] [3]Woodside, J. V., Welch, R. W., Patterson, C. C., & McKinley, M. C. (2015). Study design: intervention studies. *Nutrition research methodologies*, 28-47.
6	Oct 9 FMIC	**Flipped classroom:** *Sampling methods* **Recap & Group activity:** *Sampling methods*
7	Oct 16 NH216	**MIDTERM** **Lecture:** *Methods to assess nutritional status and body composition*
8	Oct 23 NH216	***Deadline to submit the Study Design*** **Lecture:** *Methods to determine dietary intake* **Case study:** *Nutrition studies: Data collection*
9	Oct 30 NH216	***Deadline to submit the Study Tools*** **Flipped classroom:** *Internal and external validity* **Lecture and discussion:** *Inclusion/Exclusion criteria*
10	Nov 6 FMIC	***Deadline to submit the Study Population*** **Lecture:** *Bias in nutrition research* **Group activity:** *Bias in nutrition research*
11	Nov 13 NH216	**Lecture & Case study:** *Methods of data analysis* **Educational videos [Optional]:** *Introduction to data analysis- Key concepts* **Discussion:** *Reporting of studies*
12	Nov 20 NH216	***Deadline to submit the Analysis Plan*** **Lecture:** *Ethics in research* **Application:** *IRB application* **Interview:** *Ethics in nutrition research*
13	Nov 27 NH216	**Assignment:** *STROBE & CONSORT checklists* **Lecture:** *Grant Writing* **Interview:** *Grant Writing* [Professor Maha Hoteit]
14	Dec 4 NH216	***Deadline to submit the Strengths and Limitations*** **Guest speaker:** *Qualitative research* [Dr. Rima Bahous] **Interview:** *Research in food science* [Professor Hussein Hassan] **Recorded lecture:** *Chromatography in research* [Dr. Robin Taleb] **Recorded lecture:** *Animal research* [Dr. Sama Sleiman]
15	TBD	**FINAL EXAM**



Timetable



NUT602 Timetable Fall 2024 - Excel

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A1 | Week

Week	Date	Chapter	Asynchronous activity	Live meeting (W 4.30 pm)	Assignment (due: W 4.00 pm)	Assessment
Week 1	4-Sep	**Nutrition Research**	**Video:** How to work with criticism **Activity:** Analyze a published article https://forms.gle/Ngzee3RjKpdMMrnF8	**Introduction** [Syllabus] **Discussion:** The research process **Lecture:** Nutrition research		Material included in the Midterm (16-Oct; 4.30 pm)
Week 2	11-Sep	**Literature search**	**Reading:** How to write a literature review Faryadi, Q. (2018). PhD Thesis Writing Process: A Systematic Approach—How to Write Your Literature Review. Creative Education, 9(16), 2912-2919.	**Lecture and application:** Literature search **Article discussion:** How to write a literature review		
Week 3	18-Sep	**Research question**	**Flipped classroom:** Research question **Application:** Formulating and reflecting on a research question	**Lecture:** Research question **Individual activity and discussion:** Focusing a peer's research question	Literature Review (5%)	
Week 4	25-Sep	**Population-based studies**	**Flipped classroom:** Population-based studies Cade, J., & Hutchinson, J. (2015). Study Design: Population-Based Studies. *Nutrition Research Methodologies*, 13-27.	**Group activity:** Population-based studies (5%) **Interview and discussion:** Population-based studies	Research Question (5%)	
Week 5	2-Oct	**Intervention studies**	**Flipped classroom:** Intervention studies Woodside, J. V., Welch, R. W., Patterson, C. C., & McKinley, M. C. (2015). Study design: intervention studies. *Nutrition research methodologies*, 28-47.	**Group activity:** Intervention studies (5%) **Interview and discussion:** Intervention studies		
Week 6	9-Oct	**Sampling methods**	**Flipped classroom:** Sampling methods	**Group activity:** Sampling methods (5%) **Lecture-based case study:** Nutrition studies: Practical insights		
Week 7	16-Oct	**Methods to assess nutritional status and body composition**		**Lecture:** Methods to assess nutritional status and body composition	MIDTERM (10%)	Material included in the Final (TBD)
Week 8	23-Oct	**Methods to determine dietary intake**		**Lecture:** Methods to determine dietary intake	Study Design (5%)	
Week 9	30-Oct	**Inclusion/Exclusion criteria**		**Lecture:** Inclusion/Exclusion criteria	Study Tools (5%)	
Week 10	6-Nov	**Bias in nutrition research**	**Flipped classroom:** Bias in nutrition research	**Group activity:** Bias in nutrition research (5%)	Study Population (5%)	
Week 11	13-Nov	**Methods of data analysis** **Reporting of studies**	**Educational videos:** Introduction to data analysis-Key concepts **[Optional]**	**Lecture-based case study:** Methods of data analysis **Discussion:** Reporting of studies		
Week 12	20-Nov	**Ethics in research**	**Interview:** Ethics in nutrition research	**Lecture:** Ethics in Research **Application:** IRB application	Analysis Plan (5%)	
Week 13	27-Nov	**Grant Writing**		**Lecture:** Grant writing **Interview and discussion:** Grant writing	STROBE & CONSORT checklists (10%)	
Week 14	4-Dec	**Research in food science** **Animal research**	**Interview:** Research in food science **Recorded lecture:** Chromatography in research **Recorded lecture:** Animal research	**Guest speaker:** Qualitative research	Strengths and Limitations (5%)	
Week 15	TBD				FINAL EXAM (15%)	

Sheet1 Sheet2

Ready

Flipped Classroom
+ In-class Group work/ Application

Week	Date	Lecture/activity
Pre-course		**Video:** *How to work with criticism* **Activity:** *Analyze a published nutrition research article*
1	Sept 4	**Introduction [Syllabus]** **Discussion:** *The research process* **Lecture:** *Nutrition research*
2	Sept 11	**Library session:** *Literature search* **Application:** *Literature search* **Reading:** How to write a literature review[1] **Application:** *Critique of Introduction sections of published articles* [1]Faryadi, Q. (2018). PhD Thesis Writing Process: A Systematic Approach—How to W… Literature Review. *Creative Education, 9*(16), 2912-2919.
3	Sept 18	***Deadline to submit the Literature Review*** **Flipped classroom:** *Research question* **Application:** *Formulating and reflecting on a research question* **Lecture:** *Research question* **Individual activity and discussion:** *Focusing a peer's research question*
4	Sept 25	***Deadline to submit the Research Question*** **Flipped classroom:** *Population-based studies*[2] **Group activity:** *Population-based studies* **Interview [online] and Panopto:** *Population-based studies* [P. Pascale Salameh] [2]Cade, J., & Hutchinson, J. (2015). Study Design: Population-Based Studies. *Nutrition Research Methodologies*, 13-27.
5	Oct 2	**Flipped classroom:** *Intervention studies*[3] **Group activity:** *Intervention studies* **Interview [online] and Panopto:** *Intervention studies* [Dr. Mirey Karavetian] [3]Woodside, J. V., Welch, R. W., Patterson, C. C., & McKinley, M. C. (2015). Study design: intervention studies. *Nutrition research methodologies*, 28-47.
6	Oct 9	**Flipped classroom:** *Sampling methods* **Group activity:** *Sampling methods* **Lecture-based case study:** *Nutrition studies: Data collection*
7	Oct 16	**MIDTERM** **Lecture:** *Methods to assess nutritional status and body composition*

Week	Date	Lecture/activity
8	Oct 23	***Deadline to submit the Study Design*** **Lecture:** *Methods to determine dietary intake*
9	Oct 30	***Deadline to submit the Study Tools*** **Lecture:** *Inclusion/Exclusion criteria* **Application:** *Critique of Inclusion/Exclusion criteria in published studies*
10	Nov 6	***Deadline to submit the Study Population*** **Flipped classroom:** *Bias in nutrition research* **Group activity:** *Bias in nutrition research*
11	Nov 13	**Educational videos:** *Introduction to data analysis- Key concepts [Optional]* **Lecture-based case study:** *Methods of data analysis* **Recorded lecture:** *Research in food science* [Dr. Hussein Hassan] **Recorded lecture:** *Chromatography in research* [Dr. Robin Taleb] **Discussion:** *Reporting of studies*
12	Nov 20	***Deadline to submit the Analysis Plan*** **Lecture:** *Ethics in research* **Application:** *IRB application* **Interview [online] and Panopto:** *Ethics in nutrition research*
13	Nov 27	**Assignment:** *STROBE & CONSORT checklists* **Lecture:** *Grant Writing*
		Interview [online] and Panopto: *Grant Writing* [Professor Maha Hoteit]
14	Dec 4	***Deadline to submit the Strengths and Limitations*** **Guest speaker:** *Qualitative research* [Dr. Rima Bahous] **Recorded lecture:** *Animal research* [Dr. Sama Sleiman]
15	TBD	**FINAL EXAM**

Lesson Plan for Week 3

Research Question

Lesson objectives

- Recognize the role of research questions.
- Differentiate types of research questions.
- Formulate focused research questions using the PICO(T) framework.
- Evaluate the feasibility of research questions using the FINER criteria.
- Align research questions with study design.
- Identify problems and solutions with formulating research questions.

Monday: What is a research question?
Objectives:

- Recognize the role of research questions.
- Differentiate types of research questions.

Modality: Asynchronous learning (self-paced).

- **Watch recorded videos** (4 videos, each ≈4 min long)**:**
  - RQ video part 1.mp4
  - How to Develop a STRONG Research Question | Scribbr 🎓 - YouTube
  - How to Use PICO to Refine Your Topic Question - YouTube
  - Developing a Research Question with FINER & PICOT (youtube.com)
- **Review course material:** 3. Research question.pdf

Tuesday: How to formulate and evaluate a research question?
Objectives:

- Formulate focused research questions using the PICO(T) framework.
- Evaluate the feasibility of research questions using the FINER criteria.

Modality: Asynchronous learning (self-paced) + Pair work.

- **Compose and focus one research question –** any subject related to nutrition or food science.
  - Use the 3- Research question worksheet.docx Part 1 and Part 2 document.
- **Watch and reflect on a recorded video** (≈3 min long)
  - RQ video part 2.mp4
- **Team up with a colleague and provide feedback on your teammate's research question:**

Marise + Reem	Hala + Aya	Sophia + Rita Naim	May + Sonel
Roa + Hanin	Mariam + Tala	Faten + Rava	Rita Nahoul + Me 😉

- **Choose one research question and send it to me by Email** (rana.rizk01@lau.edu.lb)

Wednesday: Practical session
Objectives:

- Align research questions with study design.
- Identify problems and solutions with formulating research questions.

Modality: Synchronous learning at 4:30 pm via WebEx: https://lau.webex.com/meet/rana.rizk01

- **Q & A.**
- **Evaluation of submitted RQ.**

Office Hours: Wednesday at 6 pm via WebEx for students needing extra help, or by appointment.

Chapter 3: Research Question

Purpose: To formulate and focus a research question.

Task:

Pre-session

1- Watch this video: RQ video part 1.mp4

2- Compose one research question – you may choose any subject related to nutrition or food science

- Use the 3- Research question worksheet.docx Part 1 document

During the session

3- Reflect on the classwork and second video: RQ video part 2.mp4

4- Focus the research question that you composed in Step 2

- Use the 3- Research question worksheet.docx Part 2 document

5- Team up with a colleague, choose one research question and provide feedback

- Feeding back is an important part of the research process, so spend some time providing considered feedback

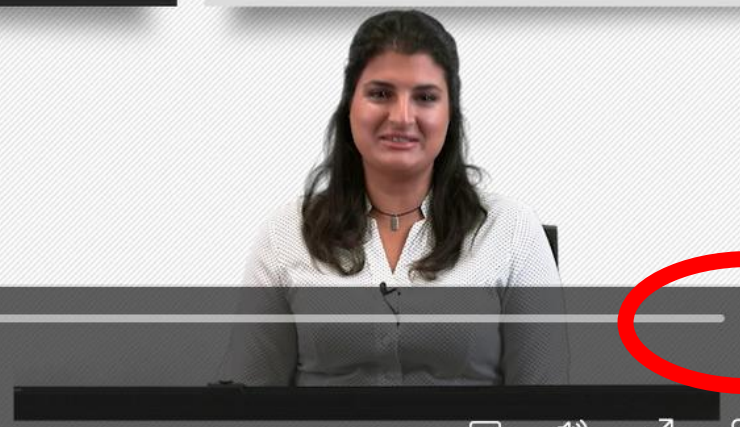
Outcome: You will have given considered thought to composing and providing feedback on a research question.

Media Player

Research Methods in Nutrition and Food Science

The Research Question

NUT602



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RQ video part 1

RESEARCH QUESTION WORKSHEET- Part 1

Steps	Your answer
1. What broad topic are you interested in? You need to do some background research to find out more about it first.	
2. What specific part of the topic are you interested in? Brainstorm or do a library search to identify possible sub-topics and pick one.	
3. List a few possible questions about your specific topic area.	
4. Choose one to be your main research question. Analysis (why or how) questions are best.	

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BUILDING YOUR RESEARCH QUESTION WITH PICO(T)- Part 2

P: Population or patient *This element identifies the issue you are investigating and who it is affecting. Remember to consider age, sex, ethnicity, general health, or any other factors that are relevant to the problem.*

Who is your population?

What is your population's problem?

Now combine these two answers to get a full picture of your population:

I: Intervention *This element considers what you are going to do about the issue you are investigating.*

What do you want to do for your population? (e.g., treat, diagnose, observe…)

How are you going to do this?

C: Comparison *This element looks at an alternative to compare against your intervention. Not all questions use a comparison.*

Are you going to compare your intervention with an alternative option?

What are you going to compare with?

O: Outcome *This element addresses what you are trying to achieve through your intervention.*

What are you trying to achieve for your population? (e.g., weight loss, decreased A1c…)

T: Time frame *This element addresses the time frame for assessment or follow-up, if any.*

Is there a specific time frame to consider?

What is it?

Building your question Now you need to bring all the PICO elements together. It doesn't matter which order you use the PICO elements and long as it make a clear question. For example: *For **adults with obesity (P)**, is **intermittent fasting (I)** more effective in **inducing weight loss at 6 months (O)** compared with **an isocaloric diet of 5 meals/snacks (C)**?*

Your question:

Media Player

PICO Framework

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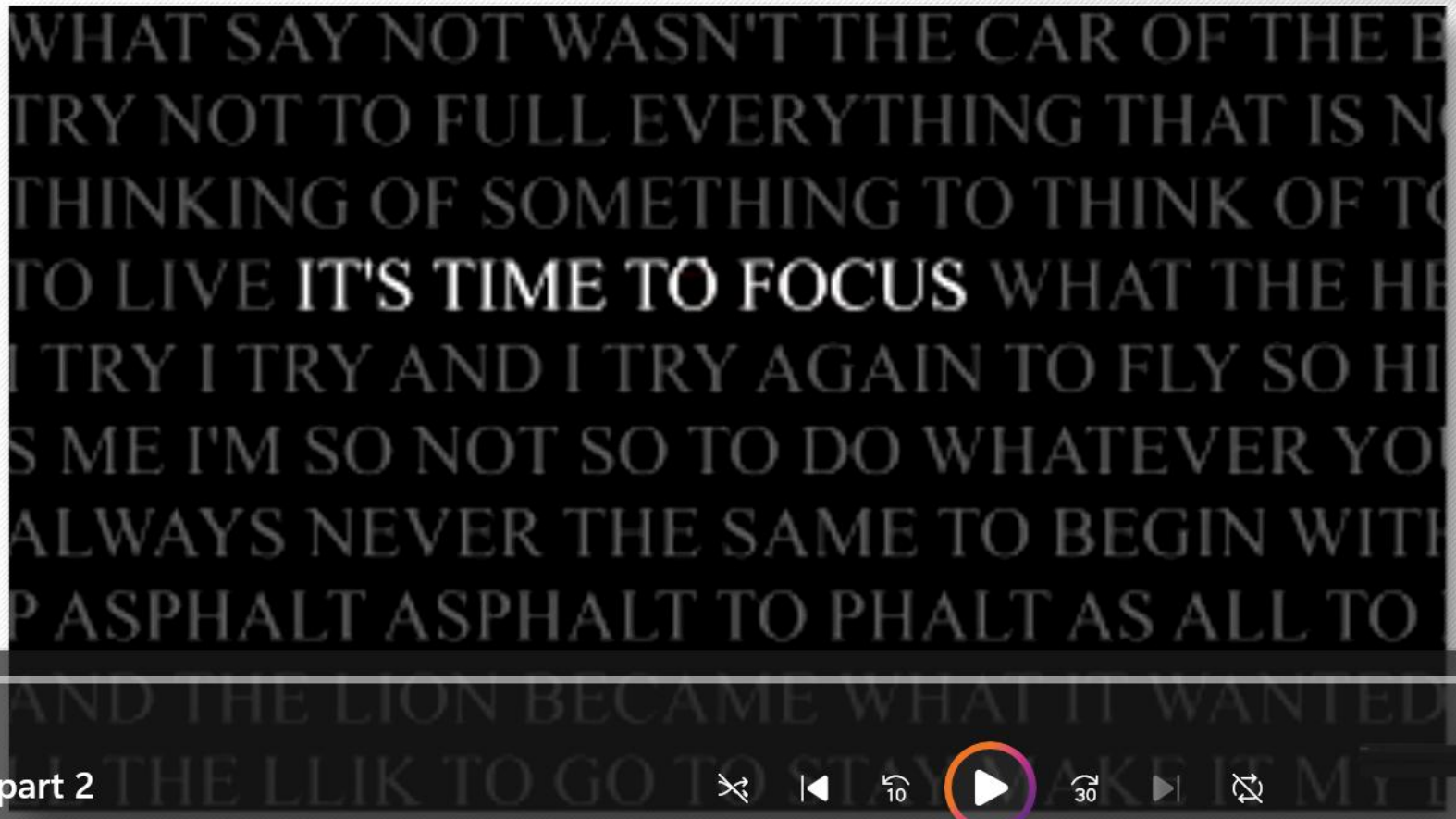

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RQ video part 2

- **Team up with a colleague and provide feedback on your teammate's research question:**

Marise + Reem	Hala + Aya	Sophia + Rita Naim	May + Sonel
Roa + Hanin	Mariam + Tala	Faten + Rava	Rita Nahoul + Me ☺

- **Choose one research question and send it to me by Email** (rana.rizk01@lau.edu.lb)

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Fall 2024

Research Question

Template for Asking PICOT Questions

INTERVENTION

In _____(P), how does _____ (I) compared to _____(C) affect _____(O) within _____(T)?

THERAPY

In _____(P), what is the effect of _____(I) compared to _____ (C) on _____(O within _____(T)?

PROGNOSIS/PREDICTION

In _____ (P), how does _____ (I) compared to _____(C) influence _____ (O) over _____ (T)?

DIAGNOSIS OR DIAGNOSTIC TEST

In _____(P) are/is _____(I) compared with _____(C) more accurate in diagnosing _____(O)?

ETIOLOGY

Are_____ (P), who have _____ (I) compared with those without _____(C) at _____ risk for/of _____(O) over _____(T)?

MEANING

How do _____ (P) with _____ (I) perceive _____ (O) during _____(T)?

In female adolescents with hepatitis B (P), how does coffee (I) compared with black tea (C) with an equal amount of caffeine affect liver function (O)?

In children with autism spectrum disorder (P), what is the effect of a gluten-free casein-free diet (I) compared with regular diet (C) on social communication (O)?

In patients who have experienced a myocardial infarction (P), how does having obesity (E) compared with having a normal weight (C) influence death rates (O) during the first 5 years after the myocardial infarction (T)?

In adolescent females with suspected orthorexia nervosa (P), is ORTO-R (I) compared with DOS (C) more accurate in diagnosing the condition (O)?

Are 30- to 50-year-old women (P) who have high blood pressure (E) compared with those without high blood pressure (C) at increased risk for an acute myocardial infarction (O) during the first year after hysterectomy (T)?

How do young males and females (P) diagnosed with celiac disease (E) perceive their social life (O) during the first year following their diagnosis (T)?

Adapted from the PICOT Questions Template; Ellen Fineout-Overholt, 2006.

Research Question - Live Session: 09/10/2024

Question Type	Definition	Template
Intervention or therapy	Used to determine which treatment leads to the best outcome	In _____ (P) how does _____ (I) compared with _____ (C) affect _____ (O) within _____ (T)
Etiology	Used to determine the greatest risk factors or causes of a condition	Are _____ (P) who have _____ (I) compared with those without _____ (C) at _____ risk for _____ (O) over _____ (T)
Diagnosis or diagnostic test	Used to determine which test is more accurate and precise in diagnosing a condition	In _____ (P) are/is _____ (I) compared with _____ (C) more accurate in diagnosing _____ (O)
Prognosis or prediction	Used to determine the clinical course over time and likely complications of a condition	In _____ (P) how does _____ (I) compared with _____ (C) influence _____ (O) over _____ (T)
Meaning	Used to determine the meaning of an experience for a particular individual, group or community	How do _____ (P) with _____ (I) perceive _____ (C) during _____ (T)

In adults with Lupus, is consuming turmeric tea more effective than Plaquenil at reducing joint pain?

1. **Population**: the population is "adult patients with Lupus," but it could be more defined. Consider specifying gender, age range, or severity of Lupus to narrow the scope.
2. **Intervention**: The intervention, "turmeric tea," could benefit from more details. What is the exact dosage, frequency, and preparation method? Is it standardized turmeric tea or homemade with variable concentrations of turmeric?
3. **Comparator**: Plaquenil (hydroxychloroquine) is a well-known standard treatment for Lupus. You may want to specify the dosage or whether patients are on stable doses.
4. **Outcome**: "Reduction in joint pain" is a broad outcome. How will pain reduction be measured? Will it be patient-reported using a standardized pain scale (e.g., Visual Analog Scale), or through clinical assessments like swelling or mobility?
5. **Time frame**: Adding a time frame for the treatment can help focus the study. For example, how long will the turmeric tea and Plaquenil treatments be compared? Over a few weeks, months, or a year?

Refined research question:
In adult female patients with moderate to severe Lupus, is drinking one cup of standardized turmeric tea (containing 20 mg of curcumin) daily more effective than taking 400 mg of Plaquenil daily at reducing joint pain, as measured by the Visual Analog Scale over 12 weeks?

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P		**F**	
I		**I**	
C		**N**	
O		**E**	
(T)		**R**	

Sonel + May
What is the prevalence and proportion of microplastics in salt samples in Saudi Arabia and how do these quantities compare to the measures of neighboring countries in the Gulf region?

Marise + Reem
During the academic year of Lebanese university students in Lebanon aged 18 to 25, do those experiencing meal skipping have an increased occurrence of the double burden of malnutrition compared ~~to~~with students undergoing other maladaptive eating behaviors?

Rita Nahoul
Does introducing laughter therapy during hemodialysis sessions increases patients' appetite, dietary intake, and eventually improves their nutritional status and quality of life (T)?

Faten
In adults with no pre-existing health conditions, does chronic dietary exposure to microplastics result in increased markers of inflammation when compared ~~to~~with minimal exposure over a period of 6 months?

Rava
In university students, does exposure to "What-I-Eat-in-a-Day" social media videos lead to increased body image distortion when compared ~~to~~with students with minimal or no exposure to such videos?

May (feedback)
In overweight and obese individuals, do mindful breathing exercises, compared to no breathing exercises, reduce emotional eating, modify dietary intake, and promote weight loss over a period of 12 weeks?
Very well written RQ using the PICOT framework; this RQ also meets the FINER criteria well. Comments:

1- Specifying the population, e.g., adults, children, adolescents,...
2- Specifying mindful breathing exercises in terms of type, duration, and frequency, as there are different types of mindful breathing exercises– done after literature review.
3- Specifying the direction of change in the outcomes and defining vague terms like dietary intake– done after literature review.

You might consider the following RQ: *In adults with overweight or obesity, how does a 12-week mindful breathing exercises intervention, compared with no intervention, affect emotional eating, dietary intake, and body weight?*

Hala + Aya
In university students in Lebanon (P), how does adherence to the Mediterranean diet (I or E) affect mental health outcomes, ~~such as~~ stress, anxiety, and depression (O) compared ~~to~~with those following a Western diet (C) over a period of 6 months?

Students' Feedback

C. Suggestions that might improve the course experience

What were the best aspects of this course?

Comments
this course taught me more than I ve been learning my whole life

What are your suggestions for making this course a better learning experience?

Comments
this can't get any better

Flipped Classroom Approach

	Benefits	Challenges
Learning depth & engagement	- Student engagement, participation, and learning ▪ Higher-order thinking skills (analysis, synthesis, evaluation) ▪ Research-oriented discussions and critical analysis	- Significant student self-discipline and preparation - Potential for unequal preparation levels among students - May increase student anxiety if they feel unprepared for in-class activities
Instructor role & interaction	- Monitor student comprehension in real time ▪ Personalized feedback during class time ▪ Address individual student needs more effectively	- Significant time for content creation and activity design: ▪ Pre-class materials ▪ Activities that foster meaningful interaction and application ▪ Clear expectations and resources for pre-class preparation; mechanisms to clarify doubts - Align assessment methods with the flipped classroom model (emphasizing application and critical thinking)
Flexibility & accessibility	- Learning at own pace outside of class - Access to learning materials for students with diverse learning needs - Accommodate technical issues	- Reliable internet