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Credit: 1.0

Description and Goals
This course aims to expand student’s knowledge on a variety of common pathophysiological conditions and integrate this knowledge with the intervention of clinical nutrition therapies. Students will begin by learning about the basic or core elements of medical nutritional therapy. These include nutritional assessment, which incorporates the use of anthropometric, biochemical and clinical data to determine nutritional status. Particular emphasis is placed on understanding energy expenditure and body composition and their components, and how these may change during physiological stress or illness. Students then learn about enteral and parenteral nutrition and fundamental aspects of nutrition support. These core elements are then applied in the study of various disease states and clinical nutrition therapy. Students also have the opportunity to explore diet and disease in an approved area of their interest through written and oral presentation.
Course Objectives/Outcomes
By the end of the course, students will be able to:

• Discuss the key elements of nutritional assessment and diet therapy, describe their alterations during various disease states and relate this information to support nutrition intervention strategies in individuals during altered pathological states.
• Interpret information from medical, social and nutritional histories, combined with biochemical and anthropometrical indices during different pathophysiological states to assess nutritional status, develop nutrition care plans, and problem solve.
• Accurately define, both in writing and orally, how pathophysiology of a selected disease state impacts nutritional status and what nutrition interventions are indicated.
• Discuss controversy in the scientific literature related to medical nutrition therapy and implications for clinical practice.

Assignments, Exams and Grade Evaluation

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Case Studies (3)</td>
<td>30%</td>
</tr>
<tr>
<td>Essay Review Paper</td>
<td>20%</td>
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<tr>
<td>Paper Presentation</td>
<td>10%</td>
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<tr>
<td>Clinical Controversy</td>
<td>10%</td>
</tr>
<tr>
<td>Online Discussions</td>
<td>10%</td>
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The following guidelines are used in evaluating course performance:
1. Class assignments will be evaluated on the basis of completeness, originality, scientific soundness and relevance to the assigned topic, as well as participation as deemed appropriate by the course instructors.

2. Written work will be evaluated on the quality of thought, completeness, and adherence to guidelines, scientific integrity, and ability to incorporate and communicate ideas and information effectively.

3. Adherence to instructions and guidelines of the assignments.

4. Attendance at all class sessions. Please see the Attendance Policy. Missed time will affect your grade unless prior arrangements were requested and approved in writing by the instructors for make-up work.

5. On-line discussions will be evaluated according to the discussion matrix.
Discussion assignment Grading Criteria

<table>
<thead>
<tr>
<th>Quality of Posting/Reply</th>
<th>Points</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>No Posting, Postings are not relevant to questions posed</td>
<td>0</td>
<td>Not Acceptable</td>
</tr>
<tr>
<td>Posting reflect reading and are relevant to questions posed</td>
<td>1</td>
<td>Met minimum standards</td>
</tr>
<tr>
<td>Postings reflect reading are relevant to questions posed and some outside source material used (must be cited)</td>
<td>2</td>
<td>Exceeded minimum standards</td>
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Attendance Policy
Upon joining this Master of Nutrition Science and Policy degree program, you become a member of a cohort, a learning group. Hopefully you will find the group experience provides you with a tremendous support system, a rich learning environment, and a long lasting network of colleagues to learn with and from. As a member of a cohort in an intensive experiential learning community, your consistent and complete participation is an essential and necessary component to the group’s success. Absences jeopardize the academic integrity of the program as well as the quality of your and your colleague’s learning experiences.

Therefore, please arrange to be present at all residency sessions during this term. Written documentation is required for any missed time. If approved to miss residency time the student will be required to work with the faculty to ensure the content is provided and make-up work may be assigned. If the missed time is not approved the student’s final grade will be docked by 2% for every hour missed.

Time extensions, make-up work, and a grade of Incomplete will only be given under the most extreme circumstances. Requests for these items must be made in advance, in writing, to the Dean for Academic Affairs and must have prior approval, in writing, of the academic adviser and the instructor.

Communication Policy
Students should try to seek out information for themselves before contacting the instructor. The answers to your questions may have already been posted by your peers or the instructors in the discussion board, which can be found on the Trunk course website. Please use the discussion board to post questions to your fellow students and the instructors about any course-related issues. If you cannot find your answer contact the instructors via email as soon as possible. Please do not wait until the last minute. Since students may not all be in the same time zone, you must give us time to respond to your question. Faculty will respond within 48 hours.
Technical Support
Online course support is provided by Friedman support staff. You can and should contact friedmanonline@tufts.edu for all technical issues, including Trunk, Tufts email, and systems access. Please do not contact faculty for technical support.

You should anticipate at least a 6-hour wait (Monday-Friday, 9:00am-5:00pm EST) before hearing back regarding a technical support request, although emails are typically returned in significantly less time.

Telephone: 617.636.4058 (Jonelle) or 617.636.2415 (Patrick)
Email: friedmanonline@tufts.edu
Skype: FriedmanOnline
Hours: 9:00am - 5:00pm Boston Time, Monday - Friday (FriedmanOnline will check for support tickets on the weekends, but typically will not respond until Monday morning unless it is an emergency).

- When emailing a technical support problem, please include as much information as possible (operating system, browser and version, a detailed description of the problem) and please be specific so we can expedite the troubleshooting process for you. You should only use your Tufts email address to submit support tickets.

Readings, Activities & Discussions
For the most up to date information regarding assigned readings, instructions, and due dates please login to your Trunk course site and click on the tab labeled "Resources."

Online Discussions
There will be two online discussions for the course. All initial posts should be between 250-400 words in length are due on Tuesday of the assigned week at 12 noon eastern time. After all of the initial posts are completed by your fellow students, choose one to reply to, and indicate to the group, in 200 – 250 words, whether it is similar or different from your opinion and what we can learn from these differences or similarities of opinion. In order to prevent overlap, please indicate on the discussion board when you have chosen a posting to reply to. Do this by creating a reply to that initial posting and in the subject line put, "Claimed by [your name]." No other student should choose an initial posting that has already been claimed. All reply posts are due by Thursday of the assigned week by 12 noon eastern time.

Exam
The first half of the course will cover the Basic Core Lecture sessions (Nutritional and Biochemical Assessment; Energy Expenditure, Body Composition and Metabolic Support in Critical Illness; Enteral Nutrition and Immunonutrition; Parenteral Nutrition; Pediatric Nutritional Assessment). The exam will cover this material.

Case Studies
Topics in specific pathological states and methods of nutritional therapy during these disease states that are presented in the lectures (e.g. renal disease, liver disease, and
gastroenterology disease) will be covered in case studies prepared by the instructors. There will be three case studies during the semester. Students will answer questions based on the case studies.

**Paper (approximately 10-15 pages, double-spaced)**
The paper topic will be chosen by the student and approved by the instructors by **July 11, 2015**. Topics should not be one that is presented as part of the scheduled lectures. The paper should focus on the nutritional implications and management in the specific disease state. An overview of physiological mechanisms of the disease and aspects of treatment should be included. Paper should include an introduction, review of literature, discussion of important findings, and conclusion. The conclusion should include directions of the future research and controversies if applicable.

**Video Presentation**
Students will provide a video presentation based on their essay paper to the class for a total of 15 – 20 minutes on the topic covered in the paper. Introduction and background: 3-5 minutes. Research findings 5-6 minutes. Recommendations and conclusion 3-5 minutes.

Grading of presentations and paper is based on organization, conciseness, clarity, thoroughness in covering the topic relevant to nutrition and pathophysiology.

**Clinical Controversy Discussion (on-line)**
The goal of the Clinical Controversy Discussion is to help students develop skills and competence in 1) interpreting scientific research as presented in peer reviewed journals, 2) abstracting relevant information, and 3) communicating findings effectively and persuasively to others. In this exercise, students will be assigned a scientific paper on a controversial clinical topic. There will be teams of students in which one student will work to present the position of their paper to the class and the second student will present the alternate position to the class.

**Clinical Applications (during residency)**
To apply information learned in the Basic Core Lecture sessions in developing plans of care using the following format:

1) Complete nutritional assessment to include anthropometric, biochemical, clinical and dietary assessment. Observe and perform techniques for measuring body composition and energy expenditure.
2) Provide recommendation on mode of nutritional therapy, rationale for suggested therapy, nutritional goals, and indications for altering nutrition regime if necessary.
3) Suggest monitoring plans, with specific parameters for assessing nutritional status and progress. These will incorporate anthropometric, biochemical and dietary evaluations. Interpretation of these and their change in a clinical setting will be applied.
4) Problem solve clinical challenges with respect to intolerance to feeds, change in clinical status, change in nutritional status, or alteration in metabolic state.
5) Provide outcome indicators for measuring success.
<table>
<thead>
<tr>
<th>DATE</th>
<th>WEEK</th>
<th>TOPIC</th>
<th>Chapter Readings (Krause)</th>
<th>Important Dates</th>
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<tbody>
<tr>
<td>May 20- May 23</td>
<td>1</td>
<td>Nutrition and Biochemical Assessment</td>
<td>4, 14, 15, 31</td>
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<td>May 24- May 30</td>
<td>2</td>
<td>Energy Expenditure, Body Composition and Metabolic</td>
<td>2, 39</td>
<td>Online Discussion: Adjusted Body Weight Controversy</td>
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<td></td>
<td>Support in Critical Illness</td>
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<td>May 31- June 6</td>
<td>3</td>
<td>Enteral Nutrition/ Immunonutrition and Parenteral Nutrition</td>
<td>20</td>
<td>Residency: June 4 (8am–12:30pm) June 5 (8am–5:30pm)</td>
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<td>Shriners Hospitals For Children</td>
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<td>June 7- June 13</td>
<td>4</td>
<td>Pediatric Nutritional Assessment, Failure to Thrive,</td>
<td>6, 7, 8</td>
<td>Online Discussion: Enteral vs Parenteral Debate</td>
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<td>Childhood Obesity</td>
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<tr>
<td>June 14 - June 20</td>
<td>5</td>
<td>Pediatric Specific Disease States and Conditions</td>
<td>43, 44, 45</td>
<td>Exam Assigned</td>
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<tr>
<td>June 21 – June 27</td>
<td>6</td>
<td>Obesity and Hyperlipidemia</td>
<td>21, 32</td>
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<tr>
<td>June 28 – July 3</td>
<td>7</td>
<td>Diabetes Mellitus and Renal Disease</td>
<td>30, 36</td>
<td>Exam Due 7/3 12 noon EST Renal Disease Case Study</td>
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<td>Assigned</td>
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<tr>
<td>July 5 – July 11</td>
<td>8</td>
<td>Nutrition and Dental Health and Eating Disorders</td>
<td>25, 10, 22</td>
<td>Renal Disease Case Study Due Paper Topics Due by</td>
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<td>July 11</td>
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<tr>
<td>July 12 – July 18</td>
<td>9</td>
<td>Liver Disease and Cancer</td>
<td>28, 37</td>
<td>Liver Disease Case Study Assigned</td>
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<tr>
<td>July 19 – July 25</td>
<td>10</td>
<td>Gastroenterology (Malabsorption, Pancreatitis, Inflammatory Bowel Disease, Short Bowel Syndrome)</td>
<td>1, 26, 27</td>
<td>Liver Disease Case Due GI Case Study Assigned</td>
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<td>Clinical Controversy Panel Discussion Topics Assigned</td>
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<td>July 26 – Aug 1</td>
<td>11</td>
<td>Clinical Controversy-online</td>
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<td>GI Case Study Due</td>
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<tr>
<td>Aug 2 – Aug 8</td>
<td>12</td>
<td>Video Presentations</td>
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<td>Essay Review Paper Due</td>
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<td>August 9- Aug 15</td>
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<td>Finals Week</td>
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Weekly Lecture Objectives for NUTB 316

**Week 1 Nutritional and Biochemical Assessment**

**Nutrition Assessment**
- Identify the types of malnutrition and role of malnutrition in hospitalization.
- Identify the purpose of nutrition screening.
- Name the components of a nutrition assessment and describe the features of each.

**Biochemical Assessment**
- Identify the serum electrolytes and potential causes of deficiencies and excesses.
- Name at least 2 markers of visceral protein status and the advantages and disadvantages associated with the use of each.
- Identify the components of a complete blood count and iron study and the role of each in the diagnosis of macrocytic and microcytic anemias.

**Week 2 Energy Expenditure, Body Composition and Metabolic Support in Critical Illness**
- Understand the inflammatory response following critical illness and the metabolic sequelae that accompanies it particularly as it relates to energy and protein metabolism.
- Identify the effects of physiologic stress and altered nutrition on body composition.
- Determine appropriate goals for nutrition support using information related to energy expenditure, and protein turnover, and substrate utilization during critical illness.

**Week 3 Enteral and Parenteral Nutrition Support/Clinical Residency**

**Enteral Nutrition Support**
- Describe different types of enteral feedings, their distinguishing characteristics, and how they are given.
- Identify tube feedings complications and strategies for their management.
- Describe composition of specialty enteral feedings and indications for their use.

**Parenteral Nutrition Support**
- Name the components of parenteral nutrition.
- Identify the indications and contraindications for central and peripheral parenteral nutrition.
- Describe the potential mechanical and metabolic complications associated with parenteral nutrition and methods of management of each.

**Clinical Residency**

**On –Site Laboratory**
- Measure body composition using dual energy xray absorptiometry
- Measure energy expenditure using indirect calorimetry
- Screen and provide nutritional assessment for pediatric burn patient
• Develop nutrition care plans for pediatric burn patients
• Develop nutrition care plan for non-burn pediatric patient (optional)

Clinical Controversy Discussion
• To critically review a scientific paper describing original research on a clinical topic of nutritional relevance (to be assigned) using a provided journal review format.
• To present the strengths and weaknesses of the paper and give persuasive argument for its merits and applicability of its findings in a clinical setting.
• To identify the strengths and weaknesses of a paper with an opposing view on the clinical topic and argue against its merits.

Week 4 Pediatric Nutritional Assessment, Failure to Thrive and Childhood Obesity
• Describe assessment of nutritional status in children using appropriate tools and markers.
• Identify specific pediatric nutritional concerns.
• Define energy and protein requirements in well and diseased children.
• Define failure to thrive, it’s causes and the criteria for its diagnosis.
• Define health risks associated with pediatric obesity.
• Describe the role of medical nutrition therapy and the various levels of management of pediatric obesity.

Week 5 Pediatric Specific Disease States
Cystic Fibrosis
• Define cystic fibrosis and its manifestations.
• Describe the nutritional management of the cystic fibrosis throughout the life cycle.
Low Birth Weight Infants
• Define prematurity and classifications of low birth weight.
• Describe the nutritional needs and unique challenges faced by premature and low birth weight infants.

Week 6 Obesity and Hyperlipidemia
Obesity
• Define obesity and its causes.
• Describe the relationship between obesity and health.
• Identify useful methods of nutrition assessment in obesity.
• Describe both medical and surgical treatment approaches to obesity and their success rates.
Hyperlipidemia
• Identify the different types of hyperlipidemias and the biochemical profiles associated with each.
• Relate the pathophysiology of hyperlipidemia to the progression of cardiovascular disease.
• Describe the role of genetics and dietary modifications in the prevention and treatment of cardiovascular disease.

**Week 7 Diabetes Mellitus and Renal Disease**

**Diabetes Mellitus**
- Discuss the epidemiology of Diabetes Mellitus.
- Identify the classifications of Diabetes Mellitus and describe the features and risk factors of each.
- Describe the components of medical nutrition therapy for type 1 and type 2 Diabetes Mellitus.

**Renal Disease**
- Identify the classifications of kidney disease.
- Describe the causes and management of renal failure.
- Name the nutritional concerns and outline the nutritional requirements and dietary modifications associated in chronic renal disease.
- Describe the methods of renal replacement therapy and the nutritional requirements and dietary modifications associated with each in end stage renal disease.

**Week 8 Nutrition and Dental Health and Eating Disorders**

**Nutrition and Dental Health**
- Describe the interrelationship between nutrition and oral health.
- Outline common oral problems through the life cycle.
- Identify how poor oral health affects nutritional status and how to eat for optimal oral health.

**Eating Disorders**
- Recognize the differences between disordered eating and eating disorders, and classify eating disorders based on the DSM-V criteria.
- Identify nutrition related consequences of disordered eating and eating disorders.
- Describe the role of the registered dietitian and of medical nutrition therapy in the treatment of eating disorders.

**Week 9 Liver Disease and Cancer**

**Liver Disease**
- Describe the association of between liver disease and malnutrition.
- Name the possible causes and treatment of various types of liver disease.
- Identify the signs and symptoms of liver disease and the nutritional implications of each.
- Define the consequences of liver disease (i.e. portal hypertension, ascites, gastrointestinal bleeding) and describe the nutritional management of each.
- Describe medical nutrition therapy in liver disease, pre and post liver transplant.
Cancer
- Define cancer, identify types of cancer, potential causes, and treatment options.
- Identify the nutritional implications associated with cancer and its treatment.
- Describe conventional nutritional therapies and complementary and alternative medicine in cancer treatment.

Week 10 Gastroenterology
- Define and differentiate maldigestion and malabsorption.
- Identify factors with cause maldigestion and malabsorption.
- Describe the clinical manifestations and nutritional management of several gastroenterological disease states, such as pancreatitis, inflammatory bowel disease, and short bowel syndrome.

Weeks 11 Clinical Controversy Panel
- To critically review scientific literature related to a controversial clinical topic
- To develop skills in persuasive argument related to a clinical topic
- To develop skills to defend a position related to a clinical topic

Week 12 Essay Paper and Video Presentation
Essay Paper
- Develop scientific writing skills
- Develop methodology for formal review scientific literature related to a specific disease state or condition
- Identify and describe in writing the background and pertinent aspects of disease states and their dietary implications

Video Paper Presentation
- To formally present literature review findings on an approved topic associating diet therapy and disease state to a group audience.
- To create presentation visual aids to facilitate discussion
- To speak as an “expert” in a chosen topics, and answer questions from the group.