

## Subject Outline

<b>Subject Name:</b>	Advanced Human Nutrition
<b>Subject Code:</b>	NMDA311
<b>Award(s):</b>	Bachelor of Health Science (Nutritional Medicine) Bachelor of Health Science (Naturopathy)
<b>Core/Elective:</b>	Core – 4 credit points
<b>Pre/co-requisites:</b>	NMDC221, BIOS222
<b>Student Workload:</b>	78 hours face to face 72 hours self-directed study
<b>Delivery Mode:</b>	<b>Face to face</b> <ul style="list-style-type: none"> <li>• 2 x 2 hours lecture</li> <li>• 2 x 1 hour tutorial</li> </ul> <b>Full Time</b> <b>Part Time</b>
<b>Subject Coordinator:</b>	Faith Best
<b>Subject Rationale:</b>	<ul style="list-style-type: none"> <li>• This subject provides students with the opportunity to apply learnt biochemical and nutritional knowledge in the development of evidenced based nutritional interventions in complex multifactorial pathologies.</li> <li>• Students will formulate clinical questions, conduct and critique relevant literature reviews, and implement best evidence through consideration of their clinical knowledge and patient values.</li> <li>• Students will devise strategies to evaluate and reflect upon themselves as an evidence-based practitioner.</li> </ul>

### Learning Outcomes:

1.	Formulate an answerable clinical question relating to identified disease or condition
2.	Conduct thorough literature review bearing on the clinical question
3.	Critically appraise the validity of scientific evidence as it relates to a particular pathology and patient
4.	Construct therapeutic intervention based on proven or indicated efficacy
5.	Implement therapeutic protocol competently
6.	Evaluate self as evidence-based practitioner

### Content:

Week	Lecture	Tutorial
1.	<b>Session 1</b> <u>Introduction (Subject outline / Subject Rationale / Subject Assessment / Student Resources):</u>	Activity: <ul style="list-style-type: none"> <li>• Students will either have a live or pre-recorded narrated presentation and demonstration introducing them to the</li> </ul>



	<ul style="list-style-type: none"> <li>Evidenced based practice (EBP). Strengths and weakness of EBP- 3 phase approach</li> <li>Review of types of knowledge, research terminology and designs</li> </ul>	Mendeley referencing software and its utility for group collaborations.
	<p><b>Session 2</b></p> <ul style="list-style-type: none"> <li>Examining the evidence – validity of clinical investigations, systematic reviews and meta-analyses</li> <li>Critiquing the evidence</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>Students are provided with primary research studies with conflicting results</li> <li>Critique papers and evaluate their quality</li> </ul> <p>Group discussion</p>
2.	<p><b>Session 3</b></p> <p><u>Interpretation of evidence:</u></p> <ul style="list-style-type: none"> <li>Statistical analyses and interpreting results</li> <li>Clinical significance versus statistical significance</li> </ul>	<p>Case study:</p> <ul style="list-style-type: none"> <li>Case scenario provides opportunity for students to ask further clinical questions relating to the patient</li> </ul> <p>Group discussion</p>
	<p><b>Session 4</b></p> <p><u>Introduction to evidenced based practice:</u></p> <ul style="list-style-type: none"> <li>Asking answerable clinical questions – disorder, intervention and outcome.</li> <li>Background and foreground questions</li> <li>Recording, storing and retrieving clinical questions.</li> <li>Benefits of formulating clear clinical questions.</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>Following on from last session, the development of clinical questions, determine which are foreground and which are background questions.</li> <li>Students may rewrite their previous questions in line with foreground and background question strategies</li> </ul> <p>Group discussion</p>
3.	<p><b>Session 5</b></p> <p><u>Introduction to evidenced based practice:</u></p> <ul style="list-style-type: none"> <li>When no evidence exists for a clinical problem – exploring theoretical and in vitro studies.</li> <li>Searching evidence to solve a patient's individual problem.</li> <li>Treatment effect, potential harm and benefit</li> <li>Applying the evidence</li> </ul>	<p>Case study:</p> <ul style="list-style-type: none"> <li>Patient presents seeking your clinical advice as to the application of a medication in comparison to a natural alternative.</li> </ul> <p>Activity:</p> <ul style="list-style-type: none"> <li>Students to perform a literature search and collate available evidence</li> </ul> <p>Group discussion:</p> <ul style="list-style-type: none"> <li>Is the research valid? Applicable to this patient? Is there any risk of harm? Students report their findings back to the class.</li> </ul>
	<p><b>Session 6</b></p> <p><u>Introduction to evidenced based practice:</u></p> <ul style="list-style-type: none"> <li>The application of evidenced nutritional actions to clinical scenarios and therapeutic interventions</li> <li>Develop evidence based strategies for problem solving</li> </ul>	<p>Guided tutorial activity:</p> <ul style="list-style-type: none"> <li>Students develop an evidenced based research strategy to aid them in their research project clinical scenario.</li> </ul> <p>Group discussion:</p> <ul style="list-style-type: none"> <li>In small groups students may discuss their research project. Tutorial facilitator answers student's questions</li> </ul>



	<ul style="list-style-type: none"> <li>Clinical Research Information Portfolios</li> <li>Self-evaluation as evidenced based practitioner</li> </ul>	and provide direction as required.
4.	<p><b>Session 7</b></p> <p><u>A literature based review of the physiological activities of Macronutrients (part 1):</u></p> <ul style="list-style-type: none"> <li>An exploration of current research regarding carbohydrates, soluble, and insoluble fibre.</li> <li>Short chain fatty acid production and disease</li> <li>GIT microbionics</li> </ul>	<p>Research tutorial:</p> <ul style="list-style-type: none"> <li>Students conduct a literature search to answer a clinical question relating to the benefits of adequate fibre and microbionics</li> </ul> <p>Class discussion relating to findings</p>
	<p><b>Session 8</b></p> <p><u>A literature based review of the physiological activities of Macronutrients (part 2):</u></p> <ul style="list-style-type: none"> <li>An exploration of current research regarding lipids, essential fatty acids, protein and individual amino acids.</li> </ul>	<p>Research tutorial:</p> <ul style="list-style-type: none"> <li>Students conduct a literature search to answer a clinical question relating to the balance of macronutrients in the diet</li> </ul> <p>Class discussion relating to findings</p>
5.	<p><b>Session 9</b></p> <p><u>A literature based review of the physiological actions of Vitamins and Minerals (part 1):</u></p> <ul style="list-style-type: none"> <li>An exploration of current research regarding water soluble vitamins, fat soluble vitamins</li> </ul>	<p>Research tutorial:</p> <ul style="list-style-type: none"> <li>In small study groups students are to search the current literature relating to vitamins and minerals on immune function, and collate important findings.</li> </ul> <p>Class discussion relating to findings</p> <p>Individual activity:</p> <ul style="list-style-type: none"> <li>How has this scientific research altered your understanding of the related mechanisms?</li> </ul>
	<p><b>Session 10</b></p> <p><u>An evidenced based review of the physiological actions of Vitamins and Minerals (part 2):</u></p> <ul style="list-style-type: none"> <li>An exploration of current research regarding minerals and trace elements</li> </ul>	<p>Case Study:</p> <ul style="list-style-type: none"> <li>A patient with frequent colds and flus presents.</li> <li>Building on last sessions research, identify additional research questions related to this individual patient</li> <li>Formulate a diet protocol based on this evidence</li> </ul> <p>Class discussion relating to findings</p>
6.	<p><b>Session 11</b></p> <p><u>The advanced nutritional management of gastrointestinal disease using contemporary scientific research :</u></p> <ul style="list-style-type: none"> <li>Coeliac disease</li> <li>Irritable bowel syndrome</li> <li>Crohn's disease</li> <li>Ulcerative colitis</li> <li>Auto-immune gastritis</li> </ul>	<p>Case study:</p> <ul style="list-style-type: none"> <li>A patient with intestinal complaints and has come for advice.</li> </ul> <p>Activity:</p> <ul style="list-style-type: none"> <li>Considering the patients individuality, create a treatment protocol including a rationale of each recommendation</li> </ul> <p>Class discussion relating to findings</p>



	<p><b>Session 12</b></p> <p><u>The advanced nutritional management of hepatological conditions using contemporary scientific research :</u></p> <ul style="list-style-type: none"> <li>Alcoholic liver syndrome</li> <li>Liver detoxification</li> <li>Chronic viral hepatitis</li> <li>Fatty liver disease</li> </ul>	<p>Case study:</p> <ul style="list-style-type: none"> <li>The previous patient returns later after receiving further pathology test results.</li> <li>Describe modifications to the previous protocol, given the new information presented</li> <li>Outline a rationale.</li> </ul> <p>Class discussion relating to findings</p>
7.	<p><b>Session 13</b></p> <p><u>Nutritional Genomics:</u></p> <ul style="list-style-type: none"> <li>Human genome project, Genotype and nutritional assessment,</li> <li>Genetic polymorphisms</li> <li>Nutrigenetics and nutrigenomics</li> </ul>	<p>Research tutorial:</p> <ul style="list-style-type: none"> <li>Students provided with a list of gene classifications which have been documented to impact a variety of disease conditions</li> <li>These will be divided amongst the students who will search the literature and collate evidence on disease implications</li> </ul> <p>Group discussion:</p> <ul style="list-style-type: none"> <li>Each group presents findings</li> </ul>
	<p><b>Session 14</b></p> <p><u>Advanced nutritional aspects of human development from a research based perspective:</u></p> <ul style="list-style-type: none"> <li>Foetal programming</li> <li>Preconception</li> <li>Pregnancy</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>To follow on from previous tutorial, consider dietary recommendations to reflect known specific implications</li> <li>Search the literature to support your recommendations</li> </ul> <p>Group discussion:</p> <ul style="list-style-type: none"> <li>Each group presents findings</li> </ul>
<p><b>NON-TEACHING WEEK</b> (note that make-up classes may be scheduled in this week)</p> <p><b>Semester 1</b> - This aligns with the week after Easter so it may fall between weeks 6 to 8.</p> <p><b>Semester 2</b> - The break week falls between Weeks 7 and 8.</p>		
8.	<p><b>Session 15</b></p> <p><u>Advanced nutritional approaches to complex disease processes utilising contemporary research:</u></p> <ul style="list-style-type: none"> <li>Down's syndrome</li> <li>Cystic fibrosis</li> <li>Cerebral palsy</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>Students are provided with a number of research articles.</li> <li>Critique and analyse the relevance of each.</li> <li>Consider why there appears to be contradictory evidence.</li> </ul> <p>Class discussion relating to findings</p>
	<p><b>Session 16</b></p> <p><u>Advanced nutritional approaches to complex disease processes utilising contemporary research:</u></p> <ul style="list-style-type: none"> <li>ADHD</li> <li>Autism</li> </ul>	<p>Group discussion:</p> <ul style="list-style-type: none"> <li>How do we measure the success of our protocols?</li> </ul> <p>Activity:</p> <ul style="list-style-type: none"> <li>Students develop a checklist analysis of successful therapeutic treatment</li> </ul>



	<ul style="list-style-type: none"> <li>• Tourette syndrome</li> </ul>	<p>interventions.</p> <p>Class discussion relating to findings</p>
9.	<p><b>Session 17</b></p> <p><u>The advanced nutritional management of cardiovascular disease from a scientific research based perspective:</u></p> <ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Hyperlipidaemia</li> <li>• Atherosclerosis</li> <li>• Congestive heart failure</li> <li>• Cardiomyopathy</li> </ul>	<p>Research activity:</p> <ul style="list-style-type: none"> <li>• Students undertake a literature search looking into the role of nutrition in ameliorating cytokine production and subsequent inflammation.</li> </ul> <p>Class discussion related to findings</p>
	<p><b>Session 18</b></p> <p><u>The advanced nutritional management of musculoskeletal/neurological conditions from a scientific research based perspective:</u></p> <ul style="list-style-type: none"> <li>• Chronic fatigue syndrome</li> <li>• Fibromyalgia</li> <li>• Motor neurone disease</li> <li>• Muscular dystrophy</li> </ul>	<p>Case study:</p> <ul style="list-style-type: none"> <li>• A patient with diagnosed CVD presents with symptoms of chronic fatigue.</li> <li>• Building on information from the last tutorial on inflammation and given this patients presenting symptoms, formulate a diet protocol based on this evidence.</li> </ul> <p>Class discussion:</p> <ul style="list-style-type: none"> <li>• Research strategies utilised</li> <li>• Treatment protocol</li> </ul> <p>Reflection:</p> <ul style="list-style-type: none"> <li>• Based on other students responses, evaluate your performance with this task</li> </ul>
10.	<p><b>Session 19</b></p> <p><u>The advanced nutritional management of psychiatric conditions from an scientific research perspective:</u></p> <ul style="list-style-type: none"> <li>• Depression</li> <li>• Anxiety</li> <li>• Bipolar disorder</li> <li>• Seasonal affective disorder</li> <li>• Obsessive compulsive disorder</li> </ul>	<p>Research activity:</p> <ul style="list-style-type: none"> <li>• Consider – documented alterations in cytokines identified in depression</li> <li>• Research - the effect of these cytokines on the acute phase response (APR) and the subsequent effect of APR on particular nutrients.</li> <li>• What might be the implications with neurotransmitter synthesis and mental health issues?</li> </ul> <p>Class discussion related to findings</p>
	<p><b>Session 20</b></p> <p><u>The advanced nutritional management of autoimmune/rheumatological conditions using contemporary scientific research:</u></p> <ul style="list-style-type: none"> <li>• Rheumatoid arthritis, ankylosing spondylitis, multiple sclerosis, SLE and scleroderma</li> </ul>	<p>Case study:</p> <ul style="list-style-type: none"> <li>• Students are presented with an RA case with concomitant depression.</li> <li>• Research - nutrient interactions with patient's drug prescription and inflammatory cytokines present in RA.</li> <li>• Consider nutrients which may modulate</li> </ul>



		<p>disease processes and the implications of the affected nutrients in exacerbation of disease progression</p> <p>Class discussion related to findings</p>
11.	<p><b>Session 21</b></p> <p><u>The advanced nutritional management of neoplastic conditions using current scientific evidence (part 1):</u></p> <ul style="list-style-type: none"> <li>Theories on cancer development and nutritional involvement</li> <li>Metastasis and nutrients to help prevent and treat neoplastic conditions</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>Students provided with a list of drug treatments.</li> <li>Each student will then design a research strategy and search the literature to expand their knowledge of this particular drug treatment</li> </ul> <p>Class discussion related to findings</p>
	<p><b>Session 22</b></p> <p><u>The advanced nutritional management of neoplastic conditions using current scientific evidence (part 2):</u></p> <ul style="list-style-type: none"> <li>Nutritional support and intervention in conjunction with surgery</li> <li>Radiation therapy</li> <li>Chemotherapy</li> <li>Hormonal treatment</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>To follow on from last session, each is to propose a nutritional and dietary support protocol, including staging pre and post treatment for each with a rationale.</li> </ul> <p>Class discussion:</p> <ul style="list-style-type: none"> <li>Research strategies utilised</li> <li>Treatment protocol</li> </ul> <p>Reflection:</p> <ul style="list-style-type: none"> <li>Based on other students responses, evaluate your performance with this task</li> </ul>
12.	<p><b>Session 23</b></p> <p><u>The advanced nutritional management of the immunocompromised using available scientific research:</u></p> <ul style="list-style-type: none"> <li>HIV and AIDS</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>Students are provided with a case study and a series of questions relating to the case</li> <li>In small groups, answer the questions via literature search where necessary</li> </ul> <p>Class discussion related to findings</p>
	<p><b>Session 24</b></p> <p><u>The advanced nutritional management of age related disease from a scientific research perspective:</u></p> <ul style="list-style-type: none"> <li>Theories of ageing</li> <li>Alzheimer's disease, dementia, and Parkinson's disease</li> <li>Mitochondrial dysfunction</li> </ul>	<p>Activity:</p> <ul style="list-style-type: none"> <li>Students are provided with a case study to consider</li> <li>Conduct a literature search on acid-alkaline balance and how this may pertain to the patient.</li> <li>Offer feasible dietary suggestions to assist</li> </ul> <p>Class discussion related to findings</p>
13.	<p><b>Sessions 25 &amp; 26</b></p> <p>Oral Presentations:</p> <p>Student research presentation. Each student presents a summary of their case, related research findings, chosen treatment protocol and rationale, as well as an overview of their</p>	



	evaluation.
<b>14.</b>	<b>Non-Teaching Week/Practical Exam Week 1.</b> Note that make-up classes may be scheduled in this week.
<b>15.</b>	<b>Non-Teaching Week/Practical Exam Week 2.</b> Note that make-up classes may be scheduled in this week.
<b>16-17</b>	<b>Final Exam Weeks.</b> There is no final exam for this subject.

**Set Text Requirements:**

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| 1. None – relevant current research literature readings provided on a per session basis |
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**Recommended journal resources:**

1. Advances in Nutrition
2. Nutrition Reviews
3. Australian Journal of Nutrition and Dietetics
4. Asia Pacific Journal of Clinical Nutrition
5. Journal of Nutrition
6. Journal of Evidenced-Based and Alternative Medicine (JEBCAM)
7. Critical Reviews on Food Science and Nutrition
8. Nutrition and Dietetics
9. International Journal of Food Science and Nutrition
10. European Journal of Clinical Nutrition
11. American Journal of Clinical Nutrition
12. Journal of Clinical Biochemistry and Nutrition
13. Nutrition Journal
14. Nutrition and Metabolism
15. Nutrition and Metabolic Insights
<p><i>There are many more nutrition journals available at Endeavour library page through <u>EBSCO</u> by searching through "publication" in Academic Search Premier</i></p> <p><a href="http://endeavour.libguides.com/content.php?pid=288570&amp;sid=2373594">http://endeavour.libguides.com/content.php?pid=288570&amp;sid=2373594</a></p>

**Assessments:**

Assessment Item	Topic/s	Learning Outcomes assessed	Session Content Delivered	Due	Weighting
<b>Part A</b> Progressive assessment Evidenced based nutritional research project (total word count 5000)	Clinical question and rationale	1	1 – 6	End of Week 4	10%



<b>Part B</b>	Literature review	2,3	1 – 10	End of Week 7	35%
<b>Part C</b>	Treatment methodology	2,3,4	1 – 20	End of Week 11	35%
<b>Part D</b>	Self evaluation and conclusion	4,5,6	1 – 24	End of Week 12	10%
<b>Part E</b>	Presentation	1 – 6	1 – 24	Week 13 in class	10%