



# SUBJECT OUTLINE

Subject Name:

**Nutritional Physiology Research**

Subject Code:

**NMDA321**

## SECTION 1 – GENERAL INFORMATION

<b>Award/s:</b>	<b>Total Course Credit Points:</b>	<b>Level:</b>
Bachelor of Health Science (Naturopathy)	128	4 <sup>th</sup> Year
Bachelor of Health Science (Nutritional and Dietetic Medicine)	96	3 <sup>rd</sup> Year
<b>Duration:</b> 1 Semester		
<b>Subject Coordinator:</b> Dr Sonia La Vita (Melbourne Campus)		
<b>Subject is:</b> Core	<b>Subject Credit Points:</b> 2	

### Student Workload:

No. timetabled hours per week:	No. personal study hours per week:	Total hours per week:
3	2	5

### Delivery Mode:

Face to Face (On Campus)	1 x 2 hour lecture	1 x 1 hour tutorial
e-Learning (Online)	Narrated PowerPoint presentations Tutorials: Asynchronous tutor moderated discussion forum and activities Student handouts, web-based resources	
Intensive Delivery (Summer School)	Contact hours are delivered over 5 weeks with 2 x 4 hour days delivered per week Content: Combination lecture and practical activities Assessment: Attendance and Active Participation - Weeks 1-5; Research Question and Rationale - Week 2; Research Summary Table - Week 3; Literature Review - Week 5; Oral Presentation of Literature Review - Week 5 Full Time Part Time	
<b>Pre-requisites:</b>	NMDC221, BIOS222	
<b>Co-requisites:</b>	SOCH311	

## SECTION 2 – ACADEMIC DETAILS

### Subject Rationale

This subject builds upon all prior nutrition subjects and expands the student's knowledge of emerging and advanced nutritional physiology concepts and understandings. The subject draws on the student's existing knowledge of physiology, nutritional biochemistry, and pathophysiology and expands on this knowledge both



through exploration of current nutrition science and mechanistic research. This subject provides students with the opportunity to critically analyse, synthesise and consolidate knowledge and apply current best-evidence incorporating complementary medicine understandings and philosophies in the clinical management and prevention of disease. Students will review the evidence of dietary approaches, foods, nutraceutical and phytochemical research associated with improvement of physiological mechanisms that underlie abnormal functioning of the human body and disease processes.

## Learning Outcomes

1. Develop an answerable clinical question relating to a specific disease or associated biological process.
2. Construct a research summary table in response to the developed clinical question.
3. Actively engage and discuss current and emerging research within nutritional medicine.
4. Critically evaluate, analyse, synthesise and consolidate current nutritional science research methodology and findings.
5. Integrate evidence-based practice (EBP) principles, complementary medicine understandings and philosophy, critical thinking, creativity and judgement to determine and recommend nutritional interventions for acute and chronic disease.

## Assessment Tasks

Type	Learning Outcomes Assessed	Session Content Delivered	Due	Weighting
<b>Attendance and Active Participation</b> (rubric-based)	N/A	N/A	Sessions 1-13	10%
<b>Research Question and Rationale</b> (500 words)	1	1-2	Week 4	20%
<b>Research Summary Table</b> (10 papers maximum)	2 & 4	1-6	Mid-semester non-teaching week	20%
<b>Literature Review</b> evidence based practice (3000 words)	3-5	1-7	Week 11	35%
<b>Oral Presentation of Literature Review</b> (10 minutes)	3	1-13	Sessions 12 & 13 (as rostered)	15%

All written assessments and online quizzes are due at 11:55 p.m. Sunday and submitted through the LMS.



### Prescribed Readings:

1. This subject requires students to search the literature using research databases to discover and evaluate the best recent articles on their topic of investigation. Guidance on conducting searches will be provided in class. Other research papers for in-class analysis and discussion will be sourced by the Subject Coordinator as they are published, and then posted on the Learning Management System for the students. Consequently the reading materials will change from study period to study period as new articles become available.

### Recommended Readings:

1. The link for the full list of relevant eJournals is available on LibGuides Nutrition Subject Guides – a mix of subscription and open access.

Subject Content		
Week	Lectures	Tutorials
1.	<p><b>Introduction</b> (Subject Outline / Subject Aims / Assessment / Teaching Resources)</p> <p><b>Nutritional Physiology Research Introduction</b></p> <ul style="list-style-type: none"> <li>➤ Evidence-based practice (EBP) vs evidence-informed practice (EIP) in clinical nutrition</li> <li>➤ Hierarchy of evidence</li> <li>➤ Types of research in nutrition science</li> <li>➤ Causation vs correlation</li> <li>➤ Translating research to clinical application</li> </ul>	<ul style="list-style-type: none"> <li>➤ Review papers using different research designs (not in-depth) <ul style="list-style-type: none"> <li>○ Observational studies <ul style="list-style-type: none"> <li>▪ Non-analytical - case report, cross-sectional</li> <li>▪ Analytical - cohort, case-control</li> </ul> </li> <li>○ Experimental studies <ul style="list-style-type: none"> <li>▪ Randomised control trial (RCT), non-randomised / quasi</li> </ul> </li> <li>○ Systematic review, meta-analysis</li> <li>○ Clinical guidelines</li> </ul> </li> </ul>
2.	<p><b>Asking Answerable Clinical Questions</b></p> <ul style="list-style-type: none"> <li>➤ The PICO Model (PICO)</li> <li>➤ Therapy, aetiology, diagnosis, prognosis questions</li> <li>➤ Extracting searchable key terms</li> <li>➤ Searching the databases</li> <li>➤ Using flow charts to report the search process</li> </ul>	<ul style="list-style-type: none"> <li>➤ PubMed advanced search techniques <ul style="list-style-type: none"> <li>○ Question provided</li> <li>○ Formulate a question and practice</li> <li>○ Identify existing knowledge (Systematic Review / Meta-Analyses (SR / MA) and using filters</li> <li>○ Library tutorial using another database (e.g., EBSCOhost)</li> </ul> </li> </ul>
3.	<p><b>Statistics in Nutrition Research - Part 1</b></p> <ul style="list-style-type: none"> <li>➤ Sampling and ethics</li> <li>➤ Distributions (standard, mean, median, mode)</li> <li>➤ Continuous variables</li> <li>➤ Categorical variables</li> <li>➤ Effect measures (brief introduction)</li> <li>➤ P-values (statistical significance)</li> <li>➤ Confidence intervals (precision of estimate)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Review two papers <ul style="list-style-type: none"> <li>○ Identify the type of variable, primary and secondary outcomes, effect measures, P-values, confidence interval (CI) clinically worthwhile effect</li> <li>○ Discuss outcomes and clinical relevance</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>➤ Clinical relevance and cost effectiveness</li> </ul>	
4.	<p><b>Statistics in Nutrition Research - Part 2</b></p> <ul style="list-style-type: none"> <li>➤ Measures of association in different research designs <ul style="list-style-type: none"> <li>○ Ratios (Relative Risk (RR)) – RCT, cohort (Odds Ratio (OR)) – case-control, (Hazard Ratio (HR)) – cohort, case-control</li> <li>○ Differences (attributable risk (AR), risk difference (RD), mean difference (MD)) – RCT, cohort, cross-sectional (e.g. survey)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Review two papers <ul style="list-style-type: none"> <li>○ Identify the type of variable, effect measures, P-values, CI, clinically worthwhile effect</li> <li>○ Discuss outcomes and clinical relevance</li> </ul> </li> </ul>
5.	<p><b>Systematic Reviews and Meta-Analysis</b></p> <ul style="list-style-type: none"> <li>➤ Cochrane database</li> <li>➤ Preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines</li> <li>➤ Summary tables</li> <li>➤ Forest plots and funnel plots (MA)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Construct an evidence summary table using 3-4 papers provided</li> <li>➤ Discuss results of SR and MA provided (first papers will be in the MA)</li> </ul>
6.	<p><b>Appraising Studies</b></p> <ul style="list-style-type: none"> <li>➤ Sources of bias and confounding</li> <li>➤ Critical Appraisal Skills Program (CASP) guidelines and risk of bias (ROB) tools</li> </ul>	<ul style="list-style-type: none"> <li>➤ Appraise paper provided using CASP guidelines</li> </ul>
7.	<p><b>Writing a Literature Review</b></p> <ul style="list-style-type: none"> <li>➤ Structure</li> <li>➤ Academic writing</li> <li>➤ Writing the abstract: what to include</li> <li>➤ Conclusions: Gaps in the research and clinical recommendations</li> </ul>	<ul style="list-style-type: none"> <li>➤ Practice constructing evidence table with individual studies selected for PICO question</li> <li>➤ Practice using CASP Guidelines on these papers</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 &amp; Online students</b> – The non-teaching week falls between Weeks 7 and 8</p>		
8.	<p><b>An Exploration of Current Clinical Research - Part 1</b></p> <ul style="list-style-type: none"> <li>➤ Clinical application of nutraceuticals and phytochemicals in disease prevention and management</li> </ul>	<ul style="list-style-type: none"> <li>➤ Case study analysis</li> </ul>
9.	<p><b>An Exploration of Current Clinical Research - Part 2</b></p> <ul style="list-style-type: none"> <li>➤ Gut-brain axis</li> <li>➤ Human microbiome</li> </ul>	<ul style="list-style-type: none"> <li>➤ Activity <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> </ul> </li> <li>➤ Class discussion <ul style="list-style-type: none"> <li>○ Translation of evidence into practice</li> </ul> </li> </ul>



<p>10.</p>	<p><b>Investigating the Mechanisms and Relationships to Disease Processes and Current Clinical Research Regarding Nutritional Modulation - Part 1</b></p> <ul style="list-style-type: none"> <li>➤ Immune dysfunction</li> <li>➤ Inflammation cytokine production</li> <li>➤ Th1 and Th2 balance</li> <li>➤ Allergy</li> <li>➤ Autoimmune</li> </ul>	<ul style="list-style-type: none"> <li>➤ Activity <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> </ul> </li> <li>➤ Class discussion <ul style="list-style-type: none"> <li>○ Translation of evidence into practice</li> </ul> </li> </ul>
<p>11.</p>	<p><b>Investigating the Mechanisms and Relationships to Disease Processes and Current Clinical Research Regarding Nutritional Modulation - Part 2</b></p> <ul style="list-style-type: none"> <li>➤ Genetic polymorphisms</li> <li>➤ Nutrigenomics</li> <li>➤ Pyroluria</li> <li>➤ Methylation</li> <li>➤ One-carbon metabolism</li> <li>➤ Foetal programming</li> </ul>	<ul style="list-style-type: none"> <li>➤ Research tutorial <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 and possible treatment interventions</li> </ul> </li> <li>➤ Group discussion <ul style="list-style-type: none"> <li>○ Each group presents findings</li> </ul> </li> </ul>
<p>12.</p>	<p><b>Nutrition and the Environment</b></p> <ul style="list-style-type: none"> <li>➤ Environmental chemicals, sources, health effects and minimisation strategies</li> <li>➤ Food toxicants and the daily diet</li> </ul>	<ul style="list-style-type: none"> <li>➤ Activity <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 searching where necessary</li> </ul> </li> <li>➤ Class discussion</li> </ul> <p><b><i>Oral Presentation of Literature Review</i></b></p>
<p>13.</p>	<p><b>Investigating the Mechanisms and Relationships to Disease Processes and Current Clinical Research Regarding Nutritional Modulation - Part 3</b></p> <ul style="list-style-type: none"> <li>➤ Aging theories</li> <li>➤ Cognitive function</li> <li>➤ Neuroplasticity</li> <li>➤ Telomeres</li> </ul>	<ul style="list-style-type: none"> <li>➤ Activity <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> </ul> </li> <li>➤ Class discussion</li> </ul> <p><b><i>Oral Presentation of Literature Review</i></b></p>
<p>14-15.</p>	<p><b>Non-Teaching Week/Practical Examination Weeks 1 &amp; 2</b> Note that make-up classes may be scheduled in this week</p>	
<p>16-17.</p>	<p><b>Final Examination Weeks 1 &amp; 2</b> There is no final exam for this subject.</p>	