Subject Name: Foundations of Human Nutrition

Subject Code: NMDF121

SECTION 1 - GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Award/s:</th>
<th>Total Course Credit Points:</th>
<th>Level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Health Science (Naturopathy)</td>
<td>128</td>
<td>Core</td>
</tr>
<tr>
<td>Bachelor of Health Science (Nutritional and Dietetic Medicine)</td>
<td>96</td>
<td>Core</td>
</tr>
<tr>
<td>Bachelor of Health Science (Myotherapy)</td>
<td>96</td>
<td>Core</td>
</tr>
<tr>
<td>Bachelor of Complementary Medicine</td>
<td>48</td>
<td>Elective</td>
</tr>
</tbody>
</table>

Duration: 1 Semester

Subject Coordinator: Vicki van der Meer (Melbourne campus)

Student Workload:

| No. timetabled hours per week: 6 | No. personal study hours per week: 4 | Total hours per week: 10 |

Delivery Mode:

Face to Face (On campus)
- 2 x 2 hour lectures
- 2 x 1 hour tutorials

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 4 x 4 hour days delivered per week
- Content: Combination lecture and tutorial activities
- Assessment: Online Quiz 1 - Week 2; Online Quiz 2 - Week 4; Case Study Report - Week 5; Online Quiz 3 - Week 6
- Full Time
- Part Time

Pre-requisites: BIOB111, BIOH111

Co-requisites: SOCQ121

SECTION 2 – ACADEMIC DETAILS

Subject Rationale

This subject establishes an essential bridge between health science and nutritional medicine. Students are introduced to the fundamentals of human nutritional science, including the biochemical and physiological functions of individual macro- and micro-nutrients, the importance of nutrients in normal cell function, energy balance and metabolism and the consequences of deficiencies or excesses on human health. This subject explores the role of scientific research and its application in nutritional medicine practice. Foundations of Human Nutrition is essential to the further study of nutritional medicine where students will develop a deeper understanding of the role of diet and nutrition in restoring, maintaining and promoting optimum health and well-being.
Learning Outcomes

1. Define the macro- and micro-nutrients and their role in health and disease.
2. Identify and discuss the function and implications of states of excess or deficiency for macro- and micro-nutrients.
3. Clarify the appropriate nutritional intake requirements for selected macro- and micro-nutrients in the maintenance and management of health.
4. Apply basic dietary guidelines including required dietary intake of specific nutrients relevant to the restoration, maintenance and promotion of health and wellbeing.
5. Appraise current research-based evidence in relation to health benefits and toxicities of macro- and micro-nutrients.

Assessment Tasks

<table>
<thead>
<tr>
<th>Type</th>
<th>Learning Outcomes Assessed</th>
<th>Session Content Delivered</th>
<th>Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Quiz 1 (30 minutes)</td>
<td>1-4</td>
<td>1-7</td>
<td>Week 5</td>
<td>20%</td>
</tr>
<tr>
<td>Online Quiz 2 (30 minutes)</td>
<td>1-4</td>
<td>8-16</td>
<td>Week 9</td>
<td>20%</td>
</tr>
<tr>
<td>Case Study Report (1250 words)</td>
<td>1-5</td>
<td>2-22</td>
<td>Week 12</td>
<td>40%</td>
</tr>
<tr>
<td>Online Quiz 3 (30 minutes)</td>
<td>1-4</td>
<td>17-25</td>
<td>Week 14</td>
<td>20%</td>
</tr>
</tbody>
</table>

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

Prescribed Readings:

3. Current research articles as outlined per session within the subject study guide reading list.

Recommended Readings:

## Subject Content

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Tutorials / Practicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Session 1</td>
<td><strong>Introduction</strong> (Subject Outline / Subject Aims / Assessment / Teaching Resources)  &lt;br&gt; <strong>Introduction to Dietary Requirements</strong>  &lt;br&gt; - Introduction to nutrition  &lt;br&gt; - Definitions of nutrition, diet, nutrient reference values (NRV), recommended dietary intake (RDI) and therapeutic dosage range  &lt;br&gt; - Global and national governing bodies and regulatory agencies  &lt;br&gt; Activities are developed to allow the students to explore relevant concepts, expand on ideas and have peer and lecturer interaction. Activities also allow for formative assessment and feedback  &lt;br&gt; - Visit the recommended websites and complete the associated activities  &lt;br&gt; - View the video presentation followed by class or on-line discussion</td>
</tr>
<tr>
<td></td>
<td>Session 2</td>
<td><strong>Macronutrients: Carbohydrates - Part 1</strong>  &lt;br&gt; - Types, sources, biochemical structures, absorption, physiological functions, RDI levels, deficiency indications, toxicity  &lt;br&gt; - Carbohydrates in health management  &lt;br&gt; - Complete worksheet and work through the exercises on calculating glucose index (GI) and glucose load (GL)  &lt;br&gt; - Discuss findings in class or on-line in your tutorial group  &lt;br&gt; - Access the recommended websites and complete the associated activities</td>
</tr>
<tr>
<td>2.</td>
<td>Session 3</td>
<td><strong>Macronutrients: Carbohydrates - Part 2 (Dietary Fibre)</strong>  &lt;br&gt; - Types, sources, biochemical structures, fermentation, metabolic effects &amp; physiological functions, RDI levels, prescribing recommendations  &lt;br&gt; - Water  &lt;br&gt; - Functions, quality, requirements  &lt;br&gt; - Water and fibre in health management  &lt;br&gt; - Read the set journal article for this tutorial  &lt;br&gt; - Thoroughly analyse the findings of this article and answer the set questions outlined in the tutorial</td>
</tr>
<tr>
<td></td>
<td>Session 4</td>
<td><strong>Macronutrients: Lipids - Part 1</strong>  &lt;br&gt; - Types, sources, biochemical structures, absorption, physiological functions, RDI levels, deficiency, toxicity, therapeutic uses  &lt;br&gt; - Lipids in health management  &lt;br&gt; - View the slides featuring pictures of foods known to contain fats  &lt;br&gt; - Complete the worksheet by filling in the class of fat each food would belong to  &lt;br&gt; - Share your findings in class or in the on-line forum</td>
</tr>
<tr>
<td>3.</td>
<td>Session 5</td>
<td><strong>Macronutrients: Lipids - Part 2 Essential Fatty Acids (EFAs) continued, Phospholipids, Sterols and Cholesterol</strong>  &lt;br&gt; - Biochemical structures, physiological functions, mechanism of action, RDI levels, deficiency indications, toxicity, therapeutic applications  &lt;br&gt; - Lipids in health management  &lt;br&gt; - Drawing upon the tutorial reading, review the findings of the paper and consider how the findings presented can / cannot be applied to clinical nutritional medicine management</td>
</tr>
<tr>
<td></td>
<td>Session 6</td>
<td><strong>Macronutrients: Protein - Part 1</strong>  &lt;br&gt; - Types, sources, biochemical structures, absorption, physiological functions, RDI levels, deficiency indications and toxicity  &lt;br&gt; - Using the provided diet diary, recall and record everything you have eaten over the past 24 hours  &lt;br&gt; - Analyse your diet and consider the amount and sources of dietary protein consumed  &lt;br&gt; - Discuss findings in class or in your on-line forum</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>4.</td>
<td>Protein in health management</td>
<td>Urea cycle, purine-pyrimidine synthesis, acid-alkaline diets</td>
</tr>
<tr>
<td></td>
<td>tutorial forum</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Session 8</td>
<td>Aromatic amino acids (Tryptophan, Tyrosine, Phenylalanine) and Aspartate</td>
</tr>
<tr>
<td></td>
<td>Macronutrients: Amino Acids - Part 1</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Session 9</td>
<td>Sulphur containing amino acids (Methionine, Cysteine, Taurine, Glutathione), Glutamine &amp; Glycine</td>
</tr>
<tr>
<td></td>
<td>Macronutrients: Amino Acids - Part 2</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Session 10</td>
<td>Lysine, Threonine, Serine, Arginine, Histidine, Alanine</td>
</tr>
<tr>
<td></td>
<td>Macronutrients: Amino Acids - Part 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session 11</td>
<td>Introduction to water soluble vitamins and Vitamin C</td>
</tr>
<tr>
<td></td>
<td>Vitamins: Water Soluble Vitamins - Part 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session 12</td>
<td>Introduction to B Group Vitamins, Vitamin B1, Vitamin B2, and inositol</td>
</tr>
<tr>
<td></td>
<td>Vitamins: Water Soluble Vitamins - Part 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session 13</td>
<td>Vitamin B3, Vitamin B5, and Biotin</td>
</tr>
<tr>
<td></td>
<td>Vitamins: Water Soluble Vitamins - Part 3</td>
<td></td>
</tr>
</tbody>
</table>
| Session 14 | Vitamin B6, Vitamin B12 and Folate  
|           | Sources, biochemical structures, absorption, physiological functions, RDI levels, therapeutic uses, deficiency indications and toxicity  
|           | Water soluble vitamins in health management  
|           | Case study |

**NON-TEACHING WEEK** (note that make-up classes may be scheduled in this week)  
**Semester 1** - This aligns with the week after Easter so it may fall between Weeks 6 to 8  
**Semester 2 & Online students** - The non-teaching week falls between Weeks 7 and 8

### 8. Session 15
**Vitamins: Fat Soluble Vitamins - Part 1**  
- Introduction to fat soluble vitamins, Vitamin A and Vitamin D  
- Sources, biochemical structures, absorption, physiological functions, RDI levels, deficiency indications and toxicity  
- Fat soluble vitamins in health management  
- Download the required reading and answer the associated questions  
  - Upon reviewing the evidence you should consider how the findings may apply / not apply to hypothetical management  
- Case study  
- Video on Vitamin K and haemorrhagic disease

### 9. Session 16
**Vitamins: Fat Soluble Vitamins - Part 2**  
- Vitamin K and Vitamin E types, sources, biochemical structures, absorption, physiological functions, RDI levels, deficiency indications and toxicity  
- Fat soluble vitamins in health management  
- Case study

### 10. Session 17
**Minerals: Macrominerals - Part 1**  
- Introduction to macrominerals, Calcium, Magnesium and Phosphorous  
- Sources, biochemical structures, absorption, physiological functions, RDI levels, therapeutic uses, deficiency indications and toxicity  
- Macro minerals in health management  
- Case study

### 11. Session 18
**Minerals: Macrominerals - Part 2**  
- Electrolytes (Potassium, Sodium, Chloride)  
- Sources, biochemical structures, absorption, physiological functions, RDI levels, therapeutic uses, deficiency indications and toxicity  
- Macro minerals in Health Management  
- Using dietary analysis software, analyse your Sodium and Potassium intake over the past 24 hours and compare your intake to the recommended dietary intakes for these minerals  
- View the video presentation on fluid electrolyte balance to assist consolidating your knowledge

### 12. Session 19
**Minerals: Microminerals - Part 1**  
- Introduction to microminerals, Chromium, Vanadium and Zinc  
- Sources, biochemical structures, absorption, physiological functions, RDI levels, therapeutic uses, deficiency indications and toxicity  
- Micro minerals in health management  
- Drawing upon the required and optional readings provided for this session, review the clinical applications of Chromium, Vanadium and Zinc and answer the tutorial activity questions  
- Choose one of the listed articles and write a short extract to answer the associated questions
### Session 20
**Minerals: Microminerals - Part 2**
- Cobalt, Selenium and Iodine
- Sources, biochemical structures, absorption, physiological functions, RDI levels, therapeutic uses, deficiency indications and toxicity
- Micro minerals in health management

- Consider the reading on Iodine fortification and then watch the video on Iodine deficiency
  - Upon completing both of these required tasks, consider the implications and benefits of Iodine fortification

### Session 21
**Minerals: Microminerals - Part 3**
- Manganese, Copper and Iron
- Sources, biochemical structures, absorption, physiological functions, RDI levels, therapeutic uses, deficiency indications and toxicity
- Microminerals in health management

- Read the recommended journal articles and answer the questions outlined for this tutorial activity

### Session 22
**Minerals: Microminerals - Part 4**
- Fluoride, Molybdenum, Boron, Silica and Bromine
- Sources, biochemical structures, absorption, physiological functions, RDI levels, therapeutic uses, deficiency indications and toxicity
- Microminerals in health management

- Students investigate the origins of water fluoridation and review the modern day benefits and health considerations
  - View the provided video presentation and discuss the main points raised

### Session 23
**Nutritional Toxicology: Toxic Metals and Other Toxic Substances**
- Cadmium, Lead, Mercury, Nickel, Aluminium, Arsenic
- Biochemical structures, absorption, physiological impacts, toxicity signs, nutritional management
- Health management of toxic metals and other toxic substances through nutritional medicine

- Case study
- Log on to the listed websites to learn more about heavy metal toxicity

### Session 24
**Nutritional Assessment**
- Dietary assessment methods and their validity

- Read the provided journal article and answer the questions outlined for this tutorial activity

### Session 25
**Nutrition in Population Health**
- Nutritional requirements, nutritional considerations, deficiencies and safety recommendations for key population groups

- View the video presentation and discuss the views portrayed in the video

### Session 26
**Dietary Theories**
- Analysis of cultural diets, diets supported by research and ‘popularised diets’

- Facilitated discussion on the application of ‘popularised diets’ in clinical practice

### Non-Teaching Week/Practical Examination Weeks 1 & 2
Note that make-up classes may be scheduled in this week

### Final Examination Weeks 1 & 2
There is no final exam for this subject