ENDEAVOUR College of Natural Health

SUBJECT OUTLINE

Subject Name: **Subject Code:**

Foundations of Human Nutrition **NMDF1**

SECTION 1 – GENERAL INFORMATION

Award/s:		**Total Course Credit Points:**	**Level:**
	Undergraduate Certificate in Building Health through Nutrition	12	1st Year
Duration:	1 Semester		
Subject is:	Core	**Subject Credit Points:**	4

Student Workload:

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

Delivery Mode*:

☐ **On campus** ☒ **Online / Digital** ☐ **Blended** ☐ **Intensive**

Weekly Session^ Format/s - 2 sessions per week:

☒ eLearning modules:	Lectures: Interactive adaptive online learning modules Tutorials: can include asynchronous tutor moderated discussion forum and activities, learning journal activities or other web-based resources

*All modes are supported by the online learning management system which will include subject documents such as handouts, readings and assessment guides.

^A 'session' is made up of 3 hours of timetabled / online study time per week unless otherwise specified. Each subject has a set number of sessions as outlined above.

Study Pattern: ☒ Full Time ☒ Part Time

Pre-requisites: Meet entry requirements for course with a background in allied health field

Co-requisites: Nil

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 wellbeing.

Learning Outcomes

1. Outline 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. Define the appropriate nutritional intake requirements for macro- and micro- nutrients in the maintenance and management of health.
4. Interpret basic dietary guidelines relevant to the restoration, maintenance and promotion of individual health and wellbeing.
5. Use current research-based evidence in relation to discussing the health benefits and potential toxicities of macro- and micro- nutrients.
6. Demonstrate accurate use of dietary analysis software to quantitatively analyse nutrient intake data and inform interpretation of individual nutrient status.

Assessment Tasks

Type	Learning Outcomes Assessed	Session Content Delivered	Due	Weighting
Online Quiz (30 minutes)	1-4	2-7	Week 5	20%
Nutrient Report (1500 words)	1-6	1-22	Week 12	30%
Final Exam (1.5 hours)	1-4	8-26	Final Exam Period	50%
All written assessments and online quizzes are due at 11:55 p.m. Sunday and submitted through the LMS				

Prescribed Readings:

1. Paxton, F. (2015). *Foundations of naturopathic nutrition: A comprehensive guide to essential nutrients and nutritional bioactives*. Allen & Unwin.
2. Whitney, E., Rolfes, S. R., Crowe, T., Cameron-Smith, D., & Walsh, A. (2019). *Understanding nutrition: Australia and New Zealand edition* (5th ed.). Cengage Learning. [ebook available]

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

Recommended Readings:

1. Food Standards Australia New Zealand. (2019, January). *Australian food composition database*.

https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/default.aspx

2. Gropper, S. S., & Smith, J. L. (2017). *Advanced nutrition and human metabolism* (7th ed.). Wadsworth; Cengage Learning. [ebook available]
3. Hendler, S. S., & Rorvik, D. M. (2008). *PDR for nutritional supplements* (2nd ed.). Thomson Reuters.
4. Nelson, D. L., & Cox, M. M. (2016). *Lehninger principles of biochemistry* (7th ed.). W.H. Freeman.
5. Osiecki, H. (2014). *The nutrient bible* (9th ed.). Bio Concepts Publishing.
6. Ross, A. C., Caballero, B., Cousins, R. J., Tucker, K. L., & Ziegler, T. R. (Eds.). (2014). *Modern nutrition in health and disease* (11th ed.). Wolters Kluwer Health. [ebook available]
7. Schlenker, E. D., & Roth, S. L. (2015). *Williams' essentials of nutrition & diet therapy* (11th ed.). Mosby; Elsevier. [ebook available]
8. Wahlqvist, M. L. (Ed.). (2011). *Food and nutrition: Food and health systems in Australia and New Zealand* (3rd ed.). Allen & Unwin.

Subject Content

Week	Lectures	Tutorials / Practicals
1.	Session 1 **Introduction to Dietary Requirements** • Introduction to nutrition science • Nutrient Reference Values (NRV), Australian Dietary Guidelines (ADG), therapeutic application • Global and national governing bodies and regulatory agencies	Asynchronous digital learning activities are developed to allow the students to explore relevant concepts; expand on ideas and revise previous knowledge; have peer and lecturer interaction and feedback. Discussion and exploration of concepts introduced: • Definitions • Natural medicine principles • NRV and ADG • Governing bodies

	Session 2
	Macronutrients: Carbohydrates - **Part 1**
	• Nutrient basics
	  ◦ biochemical structure/physical properties
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions
	• Nutrient deficiencies & excesses; signs & symptoms; NRV requirements
	• Glycaemic index and glycaemic load
		Knowledge application:
		• High risk populations
		• Health Management
		• Research/video

2.	Session 3 **Macronutrients: Carbohydrates - Part 2 (Dietary Fibre)** • Types, dietary sources, biochemical structures and physical structures, fermentation, metabolic effects & physiological functions, NRV, deficiency indications, toxicity **Macronutrient: Water** • Sources and quality, functions, NRV	Knowledge application: • High risk populations • Health Management • Research/video

	Session 4
	Macronutrients: Lipids - Part 1: Triglycerides
	• Introduction: overview of lipids
	• Triglycerides: nutrient basics
	  ◦ biochemical structure/physical properties
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions
	• Nutrient deficiencies & excesses; signs & symptoms; NRV requirements
	• Introduction to essential fatty acids (EFAs)
		Knowledge application:
		• High risk populations
		• Health Management
		• Research/video

3.	Session 5 **Macronutrients: Lipids - Part 2 Essential Fatty Acids (EFAs) continued, Phospholipids, Sterols and Cholesterol** • Physiological functions, mechanism of action, NRV, deficiency indications, toxicity • Lipoproteins and cholesterol transport	Knowledge application: • High risk populations • Health Management • Research/video

	Session 6
	Macronutrients: Protein - Part 1
	• Nutrient basics
	  ◦ biochemical structure/physical properties
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	• Nutrient functions • Nutrient deficiencies & excesses; signs & symptoms; NRV requirements	
4.	Session 7 **Macronutrients: Protein - Part 2** • Protein turnover and nitrogen balance • Deamination and transamination • Purine-pyrimidine synthesis and protein synthesis review • Acid-alkaline diet theory	Knowledge application: • High risk populations • Health Management • Case study • Research/video

	Session 8
	Nutritional Assessment
	• A, B, C, D, E pillars of nutritional assessment
	  ◦ Anthropometric assessment methods
	  ◦ Biochemical assessment methods
	  ◦ Clinical assessment methods
	  ◦ Dietary assessment methods
	  ◦ Ecological assessment methods
	• Population based assessment methods
	• Balancing Energy Needs
		Knowledge application:
		• Foodzone tutorial
		• Validity of nutritional assessments
		• Video

5.	Session 9
	Macronutrients: Amino Acids - Part 1
	• Amino acids overview
	  ◦ Essentiality; side chains; ketogenic, glucogenic; nitrogen-containing non-protein compounds
	• Branched chain amino acids: valine, leucine and isoleucine
	• Other hydrocarbon side chains: glycine, alanine
	  ◦ Sources, biochemical structures, physiological functions, deficiency indications and toxicity
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	Session 10 **Macronutrients: Amino Acids - Part 2**	Knowledge application: • High risk populations • Health Management

	• Aromatic side chains: tryptophan, tyrosine, phenylalanine; ◦ Sources, biochemical structures, physiological functions, deficiency indications and toxicity	• Case study • Research/video
6.	Session 11 **Macronutrients: Amino Acids - Part 3** • Acidic side chain groups: glutamate, glutamine, aspartate, asparagine • Sulphur-containing amino acids: methionine, cysteine, taurine and glutathione ◦ Sources, biochemical structures, physiological functions, deficiency indications and toxicity	Knowledge application: • High risk populations • Health Management • Case study • Research/video
	Session 12 **Macronutrients: Amino Acids - Part 4** • Hydroxyl side chains: threonine, serine • Basic side chains: arginine, lysine, histidine • Imino side chain: proline ◦ Sources, biochemical structures, physiological functions, deficiency indications and toxicity	Knowledge application: • High risk populations • Health Management • Case study • Research/video

7.	Session 13
	Vitamins: Water Soluble Vitamins - Part 1
	• Introduction to water soluble vitamins
	• Vitamin C: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	Session 14 **Vitamins: Water Soluble Vitamins - Part 2** • Introduction to B Group vitamins	Prior to class: Online tutorial activities to assist with preparation and revision: • Biochemical pathways

	• Vitamin B1, vitamin B2, and vitamin B3: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		• Sources
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	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: Water Soluble Vitamins - Part 3
	• Vitamin B5, biotin, choline, and inositol: Nutrient basics
	  ◦ Biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	Session 16
	Vitamins: Water Soluble Vitamins - Part 4
	• Vitamin B6, vitamin B12, and folate: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

9.	Session 17
	Vitamins: Fat Soluble Vitamins - Part 1
	• Introduction to fat soluble vitamins
	• Vitamin A and vitamin E: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	Session 18
	Vitamins: Fat Soluble Vitamins - Part 2
	• Vitamin D and vitamin K: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

10.	Session 19
	Minerals: Macrominerals - Part 1
	• Introduction to minerals
	• Structural macrominerals: calcium, magnesium, and phosphorus
	• Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing	

	Session 20
	Minerals: Macro-minerals - Part 2
	• Electrolyte macro-minerals: potassium, sodium, and chloride
	• Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

11.	Session 21
	Minerals: Microminerals - Part 1
	• Iron, copper, and zinc: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	Session 22
	Minerals: Microminerals - Part 2
	• Iodine, selenium, and manganese: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing	

12.	Session 23
	Minerals: Microminerals - Part 3
	• Fluoride, chromium, and molybdenum: Nutrient basics
	  ◦ biochemical structure
	  ◦ food sources
	  ◦ digestion and absorption
	  ◦ nutrients, foods, and conditions that inhibit/enhance bioavailability
	• Nutrient functions and metabolism
	• Nutrient deficiencies & excesses; signs & symptoms; NRV and nutrient status testing
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study
		• Research/video

	Session 24 **Nutritional Toxicology: Toxic Metals and Other Toxic Substances** • Cadmium, Lead, Mercury, Nickel, Aluminium, Arsenic • Structures, absorption, physiological impacts, toxicity signs, nutritional management • Health management of toxic metals and other toxic substances through nutritional medicine	Knowledge application: • High risk populations • Health Management • Case study • Research/video
13.	Session 25 **Other nutrients and non-nutrient health-promoting compounds** • Other trace minerals • Bioflavonoids and polyphenols • Nutrient supplementation	Knowledge application: • High risk populations • Health Management • Case study • Research/video

	Session 26
	Dietary Theories
	• Popular diet theories
	  ◦ Cultural, ethical, religious, therapeutic, scientific and fad diets
	  ◦ Features
	  ◦ Benefits and risks
	  ◦ Evidence
		Knowledge application:
		• High risk populations
		• Health Management
		• Case study: focus on vegan and vegetarian diets
		• Research/video

14.	**Non-Teaching Week/Practical Examination Week 1** Note that make-up classes may be scheduled in this week
15.	**Non-Teaching Week/Practical Examination Week 2** Note that make-up classes may be scheduled in this week
16.	**Final Examination Week 1** Students are required to sit examinations using the Respondus Lockdown Browser software per the Examination Policy – Higher Education. Refer to the LMS for exam opening and closing times.
17.	**Final Examination Week 2** Students are required to sit examinations using the Respondus Lockdown Browser software per the Examination Policy – Higher Education. Refer to the LMS for exam opening and closing times.