ENDEAVOUR College of Natural Health

SUBJECT OUTLINE

Subject Name:

Medicinal Food Science

Subject Code:

NMDM121

SECTION 1 – GENERAL INFORMATION

Award/s:		**Total Course Credit Points:**	**Level:**	
	Bachelor of Health Science (Naturopathy)	128	Core	2nd Year
	Bachelor of Health Science (Nutritional and Dietetic Medicine)	96	Core	1st Year
	Bachelor of Complementary Medicine	48	Elective	3rd Year

Duration: 1 Semester

Subject Coordinator: Lisa Strauss (Gold Coast Campus)

Subject is: Core or Elective as noted **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:

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: Essay - Week 3; Report - Week 5; Final Written Exam - Week 6
	Full Time
	Part Time

Pre-requisites: BIOH111

Co-requisites: NMDF121 (pre- or co- requisite)

SECTION 2 – ACADEMIC DETAILS

Subject Rationale

This subject introduces students to the theory and practice of food-based science, including food spoilage, food additives and natural toxins. The practical lectures encourage students to explore, present and analyse methods of food preparation and cooking, as well as cultivation and storage practices. Students explore the therapeutic potentials of various whole foods by examining their natural chemical constituents. A variety of cultural dietary medicine systems and diets are introduced, and foods are discussed from the philosophical perspectives of these

cultural systems. The practical lectures will provide an opportunity for students to gain hands on experience preparing a variety of foods with the aim of understanding the impact of incorporating them into therapeutic applications. Medicinal Food Science provides a foundation for later subjects where nutrition and diet therapy are discussed and examined in more depth.

Learning Outcomes

1. Distinguish the dietary philosophies and principles in the application of the therapeutic potentials of food categories from the perspectives of traditional knowledge, use, and research.
2. Explain the mechanism of action of the chemical constituents in nutritional compounds and functional culinary foods.
3. Explore the various manufacturing and processing methods and explain the impact they have on the environment and the nutritional and therapeutic potential of foods.
4. Investigate the influences of external factors on food quality and safety, and how this impacts both nutritional status and the therapeutic potential of foods.
5. Apply the Australian Workplace Safety and Hygiene regulations relating to working in a kitchen, preparing food for commercial use.
6. Understand food labelling regulations and applying knowledge to consumer education in this area.

Assessment Tasks

Type	Learning Outcomes Assessed	Session Content Delivered	Due	Weighting
Online Quiz 30 minutes (multiple choice, true/false, fill in the blanks)	3, 5 & 6	1-8	Week 5	15%
Essay (1250 words)	2-5	1-10	Week 9	40%
Workshop Portfolio (workbook to be completed relating to each weekly practical session) (2000 words equivalent)	1-6	1-26	Week 14	45%
All written assessments and online quizzes are due at 11:55 p.m. Sunday and submitted through the LMS				

Prescribed Readings:

1. Braun, L., & Cohen, M. (2017). *Essential herbs and natural supplements.* Churchill Livingstone; Elsevier.
2. Wahlqvist, M. L.& Gallegos, D. (Eds.). (2011). *Food and nutrition*: *Food and health systems in Australia and New Zealand* (3rd ed.). Allen & Unwin.

A reading list that contains links to recent articles on phytochemicals and current research will be available to the students on the Learning Management System.

Recommended Readings:

1. Boye, J.I., (2015). *Nutraceutical and Functional Food Processing Technology*. John Wiley & Sons, Ltd. [ebook available]
2. Fedoroff, N. V., & Brown, N. M. (2004). *Mendel in the kitchen: A scientist's view of genetically modified foods*. Joseph Henry Press. [ebook available]
3. Higdon, J. & Drake, V. (2013). *An evidence-based approach to phytochemicals and other dietary factors*. (2nd ed.). Thieme Medical Publishers [ebook available]
4. Kirchmann, H., & Bergström, L. (Eds.). (2009). *Organic crop production: Ambitions and limitations.* Springer. [ebook available]
5. Nestle, M. (2013). *Food politics: How the food industry influences nutrition and health* (10th ed.). University California Press. [ebook available]
6. Salter, A., Wiseman, H., & Tucker, G. (Eds.). (2012). *Phytonutrients.* Wiley; Blackwell. [ebook available]
7. Schlenker, E. D., & Roth, S. L. (2015). *Williams' essentials of nutrition & diet therapy* (11th ed.). Mosby; Elsevier. [ebook available]
8. Spencer, J., & Crozier, A. (2012). *Flavonoids and related compounds: Bioavailability and function.* CRC Press. [ebook available]
9. Watson, R., & Preedy, V. (Eds.). (2013). *Bioactive food as dietary interventions for liver and gastrointestinal disease.* Elsevier. [ebook available]
10. Whitney, E., Rolfes, S. R., Crowe, T., Cameron-Smith, D., & Walsh, A. (2019). *Understanding nutrition: Australia and New Zealand edition* (4th ed.). Cengage Learning. [ebook available]

Subject Content

Week	Lectures	Tutorials / Practicals
1.	Session 1 **Introduction** (Subject Outline / Subject Aims / Assessment / Teaching Resources) **Introduction to Medicinal Food Science** • Dietetic principles in Nutritional Medicine (NM) • Review of recommended dietary intake (RDI) and underpinning principles • Food as medicine concepts and principles	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 • Students will become acquainted with online nutritional medicine research databases available through LibGuides. • Video and discussion • Facilitated discussion

	Food Science - Farming Methods • Conventional farming practices: crop rotation, hydroponics, pesticides, herbicides • Organic and biodynamic farming • Impact of farming methods on the environment and food quality	◦ Is it necessary for organic foods to be a part of a healthy diet? • Environmental impacts of conventional and organic farming methods
	Session 2 **Workshop – Kitchen Safety and Workplace regulations** • Kitchen safety and hygiene • Workplace foodservice regulations • Essential components of a kitchen for processing functional food • Overview of functional food vs. nutraceutical • Define superfood ◦ Nutrient losses in cooking, preparation and storage	• Group work ◦ Students will prepare a short communication to educate the lay person on the most appropriate preparation and cooking techniques to minimise nutrient losses
2.	Session 3 **Food Science - Food Labelling Regulations** • The role of Food Standards Australia New Zealand (FSANZ) • Labelling regulations • Genetically modified foods **Food Science - Food Manufacturing and Processing Techniques** • Milling, canning, blanching, freezing, pasteurisation, dehydration, peeling, irradiation • The advantages and disadvantages of food manufacturing and processing techniques	• View and respond activity ◦ Students will be provided with examples of food labels in which they are to identify all the FSANZ regulatory guidelines and discuss their appropriateness • Reading and review ◦ Draw on the prescribed reading and review the impacts of food manufacturing and processing on the nutritional profile of foods
	Session 4 **Workshop – Food Science** • Practical workshop looking at blanching, peeling, dehydration and freezing foods, and the impact this will have on the therapeutic benefit of prescribing such foods.	• Hands on activity involving blanching, peeling, dehydrating and freezing food
3.	Session 5 **Food Science - Food Additives** • Colours, flavours, preservatives and other additives • Health effects of food additives in food	• Read and review ◦ Using the required reading for this session, review the findings of the study and discuss how food additives may impact upon health outcomes

	Food Spoilage and Disease • Investigate food spoilage, food mediated disease (caused by micro-organisms), and natural toxins associated with deleterious health outcomes	
	Session 6 **Workshop – Food Additives** • Practical workshop exploring food additives and the impact it has on presentation and taste, as well as preservation and length of time foods can be naturally preserved	• Hands on workshop exploring natural food based additives and the impact they can have on food
4.	Session 7 **Food Science Introduction to Functional Foods** • Phytochemicals • Prebiotics • Probiotics • Antioxidants	• Facilitated discussion ◦ Students establish two main meals and one breakfast to assist in the relief of menopausal symptoms and two main meals and one breakfast designed for Cardiovascular diseases (CVD) • CVD risk reduction
	Session 8 **Workshop – Raw Foods** • Practical workshop exploring raw foods and their phytochemical properties	• Creating easy snacks and salads with raw, whole foods for specific therapeutic benefits
5.	Session 9 **Food & Culture: A Physiological Perspective** • Kitchen pharmacy • Topical treatments and poultices	• Students investigate culinary herbs and whole foods that can be used to make some of the remedies in the kitchen pharmacy
	Session 10 **Workshop – Kitchen Pharmacy** • Practical workshop exploring a variety of foods which can be used as poultices and for topical treatment; for example banana peel for warts and mustard seed poultices for specific therapeutic conditions	• Using some of the foods identified in Session 9, students will learn how to make some of the remedies in the kitchen pharmacy

6.	Session 11
	Food & Culture: A Physiological Perspective (continued)
	• Philosophies and principles of diet therapy in traditional Chinese medicine (TCM)
	• Philosophies and principles of diet therapy in Ayurvedic medicine
		• Facilitated class discussion
		  ◦ The principles and philosophies of TCM and the application of TCM diet therapy in an holistic nutritional setting
		• Worksheet
		  ◦ Students review the principles and practices of Ayurvedic medicine and fill out their worksheets
		• Facilitated class discussion

		○ The comparison and clinical application of TCM versus Ayurvedic diet therapy
	Session 12 **Workshop – Eastern Dietary Principles** ● Practical workshop exploring the preparation of foods according to TCM and Ayurvedic philosophies and principles	● Students will explore a selection of culinary herbs and whole foods used in cooking according to traditional TCM and Ayurvedic philosophies and principles
7.	Session 13 **Food as Medicine: Culinary Herbs and Spices** ● Onion, garlic, ginger, chili, rosemary, nutmeg, fennel, cloves ● Cinnamon, mint, coriander, turmeric, basil, oregano, parsley, thyme, sage, black pepper, lemon balm ● Nutritional values, phytochemical profiles and therapeutic benefits	● Case study ● Read and review ○ Drawing upon the required readings, consider the benefits of these culinary spices in the nutritional medicinal management of health and disease
	Session 14 **Workshop - Herbs and Spices** ● Practical workshop exploring the methods of determining viable culinary herbs and spices for use in cooking and various drying methods. ○ Using fresh herbs and spices vs. dry herbs and spices and their respective therapeutic benefits ○ Exploring a variety of fresh herbs that can be prepared as a tea and the therapeutic benefit of these	● Students will select a variety of fresh culinary herbs and spices to be dried for future use ● Students will explore a variety of fresh culinary herbs that can be prepared as a tea
	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 **Food as Medicine: Pulses (Legumes) and Grains** ● Improving the digestibility of pulses ● Nutritional values, phytochemical profiles and therapeutic benefits	● Literature search ○ Conduct your own literature search, using the library database, for more information on pulses and grains ○ Consider the information you find in regard to its application / non application in nutrition management
	Session 16 **Workshop – Pulses and Grains** ● Practical session exploring the methods of preparing pulses and grains for cooking, including soaking and activating	● A practical session in which students will prepare pulses and grains for soaking and activating

9.	Session 17
	Food as Medicine: Vegetables
	• Cruciferous vegetables
	• Cucurbitaceae family
	• Solanaceae family
	• Chenopodiaceae family
	• Other vegetables
	• Nutritional values, phytochemical profiles and therapeutic benefits
		• Reading and review exercise
		  ◦ Review the role of cruciferous vegetables and more specifically their phytochemicals, such as indole-3-carbinol, in nutritional medicine management
		  ◦ Students will identify the potential advantages and disadvantages associated with cruciferous vegetables and their phytochemicals in the management of specific health conditions
		• Reading and response
		  ◦ Review the effects of the carotenoid, lycopene in prostate cancer risk reduction and answer the questions provided
		• Facilitated discussion
		  ◦ The health benefits associated with foods from the Solonaceae family and circumstances when these foods should be avoided

	Session 18 **Workshop - Vegetables** • Practical workshop exploring preparation methods of vegetables, including storage and preservation	• Students will create juiced vegetable blends for specific therapeutic benefits
10.	Session 19 **Food as Medicine: Fruits** • Enzyme-rich fruits • Rutaceae family • Antioxidant-rich fruits • Oxygen Radical Absorbance Capacity (ORAC) values • Other fruits • Nutritional values, phytochemical profiles and therapeutic benefits	• Students develop enzyme-rich fruit recipes and explain the potential health benefits associated with these foods • Facilitated discussion ◦ The value and the limitations of ORAC units in ranking antioxidant potential of various foods
	Session 20 **Workshop - Fruits** • Practical workshop exploring preparation methods of fruits, including storage and preservation.	• Students will create juiced fruit blends for specific therapeutic benefits ◦ Creating snacks and desserts using whole foods for specific therapeutic benefits
11.	Session 21 **Food as Medicine: Medicinal Mushrooms, Algae and Sprouts**	• Reading and response

	• Medicinal mushrooms • Algae • Sprouts • Nutritional values, phytochemical profiles and therapeutic benefits **Food as Medicine: Fermented Foods and Probiotics** • Nutritional values, phytochemical profiles and therapeutic benefits	○ Review and discuss the current research available on the health effects of medicinal mushrooms and spirulina • Video presentation on the fermenting process
	Session 22 **Workshop - Fermented Foods** • Practical workshop on creating fermented foods and drinks	• Students will begin to prepare foods and drinks for fermenting
12.	Session 23 **Food as Medicine: Nuts, Seeds and Oils** • Nuts • Seeds • Oils • Nutritional values, phytochemical profiles and therapeutic benefits	• Facilitated discussion ○ The health benefits and potential health hazards associated with nuts, seeds and oils
	Session 24 **Workshop – Nuts and Seeds** • Practical workshop on preparing nuts and seeds, including activating them; processing them into pastes / butters and milks	• Students will prepare nuts and seeds for activation • Students will select a variety of nuts and seeds to be made into pastes, butters and / or milk
13.	Session 25 **Food as Medicine: Caffeine** • Coffee • Tea • Cocoa • Energy drinks • Nutritional values, phytochemical profiles, therapeutic benefits and health risks **Other Food-based Chemicals** • Alcoholic beverages **Food as Medicine: Sweeteners** • Natural sweeteners • Artificial sweeteners and sugar replacers • Nutritional values, phytochemical profiles, therapeutic benefits and health risks **Phytochemical Toxicity**	• Video presentation and discussion • Facilitated discussion on the potential benefits and adverse effects of caffeine-containing foods and beverages • Students prepare a communication with recommendations on ways to reduce consumption of sugars and refined carbohydrates • Case studies

	• Evidence of the harmful effects and toxicity associated with prolonged or high dosing of certain phytochemical supplements	
	Session 26 **Workshop - Beverages** • Practical workshop on preparing caffeinated beverages and the impact of a variety of milks and milk alternatives has on the taste and nutritional benefit of the beverage	• Students will explore the impact that using different varieties of milks and milk alternatives has on caffeinated beverages
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** There is no final exam for this subject.	
17.	**Final Examination Week 2** There is no final exam for this subject.	