

The College of Naturopathic Medicine

DIPLOMA OF NATUROPATHIC NUTRITION

Lecture Guide: Nutrition 1 Semester 1

Unit 1: Foundations of Naturopathic Nutrition

Unit 1: Foundations of Naturopathic Nutrition

Topics

- 1 History and Philosophy of Naturopathic Nutrition
- 2 Research Methods
- 3 Chemistry and Nutritional Biochemistry part 1
- 4 Chemistry and Nutritional Biochemistry part 2
- 5 Vitamins
- 6 Vitamins and Minerals
- 7 Minerals
- 8 Proteins and Amino Acids
- 9 Lipids and Essential Fatty Acids
- 10 Food Labelling, Composition Tables and Dietary Assessment

Core Learning Outcomes

Your Core Learning Outcomes form the basis of your study programme. For more detailed descriptions of what you will be learning please read the relevant sections of your Lecture Guide below.

Unit 1

- 1. History and Scope of Nutritional Therapy** Describe the history and development of nutritional therapy and the various philosophies that have shaped the practice of naturopathic nutrition.
- 2. Research** Gather and analyse relevant information from a wide variety of standard and accepted reference sources
- 3. Biochemistry** Discuss the key concepts in biochemistry.
- 4. Macronutrients** Outline the macronutrient structure and metabolism with specific emphasis on their role in metabolic physiological processes.
- 5. Micronutrients** Outline the dietary sources, bioavailability and interactions of micronutrients.
- 6. Micronutrients** Discuss the functions, deficiency states, therapeutic uses and safety considerations that apply to micronutrients.
- 7. Food Composition and Properties** Discuss and apply the use of food composition and classification tables and software to help measure the nutrient status of foods, including the use of Dietary Reference Values.
- 8. Food Composition and Properties** Explain the factors affecting energy intake, energy expenditure and the bodily mechanisms for control of food intake.

Essential Reading

CNM Referencing Guidelines for Students. London: CNM. Available from student website.

Haas, E. (2006). *Staying Healthy with Nutrition: The Complete Guide to Diet and Nutritional Medicine – 21st Century Edition*. Berkeley: Celestial Arts. **ISBN 9781587611797**

Langley, S. *The Naturopathic Workbook*. London: CNM.

Pizzorno, J. & Murray, M. (2012). *Textbook of Natural Medicine*. 4th Edn. New York: Churchill Livingstone Elsevier **ISBN 9781437723335**

Recommended Reading

Balch, P. (2010). *Prescription for Nutritional Healing: A Practical A-Z Reference to Drug-free Remedies Using Vitamins, Minerals, Herbs and Food Supplements*. 5th Edn. USA: Avery Publishing. **ISBN 978-1583334003**

Batmanghelidj, F. (1993). *Your Body's Many Cries for Water: a Revolutionary Way to Prevent Illness and Restore Good Health*. Global Health Solutions **ISBN 978-0953092154**

British National Formulary London: British Medical Association. **ISBN 978-0-85711-272-9**

Bruce, E. (2003). *Living Foods for Radiant Health: The Authentic Guide to Using Fresh and Raw Foods*. USA: Harper Collins. **ISBN 978-0007121175**

Cairney, E. (2011). *The Sprouter's Handbook*. 3rd Rev. Edn. Argyll Books. **ISBN 9781906134754**

Erasmus, U. (1994). *Fats that Heal, Fats that Kill*. USA: Alive Books. **ISBN 978-0920470381**

Food Standards Agency. (2008). *Manual of Nutrition*. 11th Edn. UK: The Stationery Office Books. **ISBN 978-0112431169**

Fuhrman, J. (1995). *Fasting and Eating for Health*. St. Martin's Press **ISBN 978-0312187194**

Gaby, A. (Ed) (2006). *A-Z Guide to Drug-Herb-Vitamin Interactions*. 2nd Ed. USA: Three Rivers Press **ISBN 978-0307336644**

Gibney, M., Lanham-New, S., Cassidy, A. & Vorster, H. (2009). *Introduction to Human Nutrition*. 2nd Edn. UK: Wiley-Blackwell **ISBN 9781405168076**

Greenhalgh, T. (2014). *How to Read a Paper: The Basics of Evidence Based Medicine*, 5th Edition. Chichester:BMJ books. **ISBN 978-1118800966**

Higdon, J. (2011). *An Evidence-Based Approach to Vitamins and Minerals*. 2nd Edn. Thieme Publishing Group. **ISBN 978-3131324528**

Johns, C. (2013). *Becoming a Reflective Practitioner*. 4th Edn. Oxford: Blackwell Publishing **ISBN 978-0470674260**

Jones, S. & Quinn, S. (Eds) (2005). *Textbook of Functional Medicine*. USA: Institute of Functional Medicine. **ISBN 978-0977371303**

Kane, M. (2004). *Research Made Easy in Complementary & Alternative Medicine*. London: Churchill Livingstone **ISBN 978-0443070334**

Lanham-New, S, Macdonald, A, & Roche, H. (2010). *Nutrition & Metabolism*. 2nd Edn. UK: Wiley-Blackwell **ISBN 9781405168083**

Leon, M. (Ed) (2006). *Fox and Cameron's Food Science and Nutrition and Health*. 7th Edn. London: Hoober Arnold Publishers. **ISBN 978-0340809488**

Liska, D. et al. (2004). *Clinical Nutrition A Functional Approach*. 2nd Edn. Washington: The Institute for Functional Medicine **ISBN 0977371328**

Lord, R. & Bralley, J. (2008). *Laboratory evaluations for integrative and functional medicine*. 2nd edn. Duluth, Georgia: Metamatrix Institute. **ISBN 978-0967394947**

Mateljan, G. (2015). *The World's Healthiest Foods*. 2nd Ed. USA: George Mateljan Foundation. **ISBN 9780976918516**

McCance, E. & Widdowson, R. (2014). *The Composition of Foods:7th Summary Edition*. UK: Royal Society of Chemistry. **ISBN 978-1849736367**

Munro-Hall, G. & L. (2010). *Toxic Dentistry Exposed: The Link Between Dentistry and Chronic Disease*. Published by the authors. **ISBN 978-0955220715**

Murray, M. & Pizzorono, J. (2005). *Encyclopaedia of Healing Foods*. USA: Atria Books. **ISBN 978-0749909710**

Osiecki, H. (2014). *The Nutrient Bible*. 9th Ed. Brisbane: Bioconcepts Publishing **ISBN 9781875239542** www.holisticpage.com.au/_Henry_Osiecki.php

Pitchford, P. (2002). *Healing with Whole Foods*.3rd Edn. USA: Atlantic Books. **ISBN 978-1556434303**

Rollnick, S. , Miller, W. & Butler, C. (eds) (2008). *Motivational Interviewing in Healthcare: Helping Patients Change Behaviours*. New York: The Guildford Press. **ISBN 9781593856120** Pdf copy available at: <http://web.vu.lt/mf/r.viliuniene/files/2014/10/Motivational-Interviewing-in-Health-Care.-Helping-Patients-Change-Behavior.pdf>

Sarris, J. & Wardle, J. (2014). *Clinical Naturopathy: an evidence-based guide to practice*. 2E Australia: Churchill Livingstone Elsevier. **ISBN 978-0729541732**

Unit 1: Foundations of Naturopathic Nutrition

1: History and Philosophy of Naturopathic Nutrition

Aims:

To describe the history and development of nutritional therapy and the various philosophies which have shaped the practice of the modern naturopathic nutritional therapist.

Learning Outcomes:

On successful completion you will be able to

1. Describe the history and development of nutritional therapy and the various philosophies and practices that have shaped naturopathy and naturopathic nutrition

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Broadly discuss the historical concept of 'nutrition as medicine' as held by the ancient Greeks, Ayurvedic and traditional Chinese medicine philosophies.
2. Describe the relevance of naturopathic nutrition in both a functional and clinical environment.

Material to be covered

- Naturopathic philosophy and guiding principles, including an introduction to hydrotherapy
- Holistic approach to naturopathic nutritional therapy.
- Brief introduction to the Greek, Ayurvedic and traditional Chinese medicine philosophies to food.
- How ancient models in nutritional therapy have evolved and developed, how these tend to change with time and the similarities and differences between different concepts
- Introduction to the systems approach to clinical nutrition and relevance to patient centred care

Student Required Reading

Text	Pages
Staying Healthy With Nutrition	Chapter 1
Textbook of Natural Medicine 4 th edition	Chapters:1, 3, 5, 32, 39, 40, 44, 48 & 49
The Naturopathy Workbook	6-15

Additional Reading

Text	Pages
Clinical Nutrition A Functional Approach	1-15
Textbook of Natural Medicine 4 th edition	Chapters: 4 & 6

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2: Research Methods

Aims:

- To provide an overview of how to conduct, evaluate and present research from a variety of different sources
- To outline how students can research and evaluate the effectiveness of their clinical practice, including reflective practice

Learning Outcomes:

On successful completion you will be able to :

1. Utilise a wide range of research materials
2. Evaluate different types of research materials in terms of clinical importance, accuracy and bias
3. Demonstrate use of appropriate referencing guidelines

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

- Identify different sources of research data including online texts, books, journals and research papers
- Utilise differing types of research available for review including clinical trials, quantitative and qualitative research
- Understand how research data may be influenced by a number of factors including: research method, author, date of completion, size and scope of study
- Demonstrate the skills required to find, review and evaluate information from an evidence based perspective
- Demonstrate understanding of the importance of appropriate referencing when preparing written assignments

Material to be covered

- Overview of different kinds of research (primary, secondary, laboratory, clinical, RCTs, cohort studies, case studies, etc.)
- Reasons for doing research, research definition, Evidence Based Medicine, importance of using a variety of sources
- Places of publication for research (books, newspapers, journals, etc.)
- Control mechanisms of research (editor, peer review, funding, etc.)
- Plagiarism and how to avoid it
- Referencing guidelines including bibliography and reference list
- How to find research papers ie. online databases such as PubMed, Cochrane, BioMedCentral, Google Scholar, etc./specialist journal
- Appraising research publications (basic assessment criteria, internal, external validity).
- Research terms and basic statistics (mean median, p-value, etc.)

Student Required Reading

Text	Pages
<i>CNM Referencing Guidelines for Students</i> . London: CNM. Available from student website.	All
Textbook of Natural Medicine	Chapter: 8

Additional Reading

Greenhalgh, T (2014) <i>How to Read a Paper: The Basics of Evidence Based Medicine</i> , 5th Edition. Chichester: BMJ books.
Kane, M (2004) <i>Research Made Easy in Complementary & Alternative Medicine</i> . London: Churchill Livingstone.
Please see your Research Methods handout for additional reading links

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3: Nutritional Biochemistry Part 1

Aims:

To understand the principles of chemistry as applied to biological systems; including the biochemical structure and function of water, buffers, enzymes and the macronutrients and their role in metabolic processes.

Learning Outcomes:

On successful completion you will be able to

1. Outline the key concepts in biochemistry including water and buffers.
2. Outline the macronutrient structure and metabolism - proteins, carbohydrates, lipids and nucleotides - with specific emphasis on their role in metabolic physiological processes.

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Outline the basic chemical structures, their behaviours and bonding in biological systems.
2. Outline the structure and functions of water and buffers with regard to physiological processes.
3. Describe structural characteristics, functions and digestion of carbohydrates, lipids and proteins.

Material to be covered

- The basic chemical reactions and structures and their behaviour and bonding in biological systems. Key fundamental concepts in biochemistry, including proteins, lipids, carbohydrates and nucleotides, and their anabolic and catabolic processes. The structure and function of water and buffers and how they affect physiological processes in the body.

Student Required Reading

Text	Pages
Staying Healthy with Nutrition	Chapter: 2
Tortora & Derrickson: Principles of Anatomy & Physiology – see your Biomedicine required text	Chapter: 2

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4: Nutritional Biochemistry Part 2

Aims:

To understand the principles of chemistry as applied to biological systems; including the processes of energy production; and biochemical structure and function of water, buffers, enzymes and the macronutrients and their role in metabolic processes.

Learning Outcomes:

On successful completion you will be able to

1. Outline the structure and function of nucleic acids and enzymes.
2. Outline the process of energy production and identify key enzymes and nutrient cofactors.
3. Outline the process of gluconeogenesis.

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Describe the structure of nucleic acids and their role in genetics and protein synthesis.
2. Describe the structure and function of enzymes and enzyme cofactors and their role in metabolic pathways.
3. Describes the structure and role of ATP as an energy currency.
4. Describe the process of energy production from carbohydrates, fats and protein, including important enzymes and nutrient cofactors.
5. Explain the concept of gluconeogenesis.

Material to be covered

- The structure and function of nucleic acids, key enzymes and nutrient cofactors. Energy production from carbohydrates, fats, and protein. The process of gluconeogenesis.

Student Additional Reading

Text	Pages
Clinical Nutrition A Functional Approach	Chapter: 8
Tortora & Derrickson: Principles of Anatomy & Physiology – see your Biomedicine required text	Chapter: 2

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5: Vitamins

Aims:

To provide an overview of vitamins and define the specific characteristics of vitamins A, D, E, K, B1 (thiamine), B2 (riboflavin), Niacin, B6 and B12 (pantothenic acid)

Learning Outcomes:

On successful completion you will be able to

1. Outline the dietary sources, bioavailability and interactions of these micronutrients
2. Discuss the functions, deficiency states, therapeutic uses and safety considerations that apply to these micronutrients
3. Outline appropriate dosage levels and preferred forms for micronutrients

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Name the key food sources of the given micronutrients
2. Discuss the absorption and metabolism of dietary and supplemental sources of these micronutrients
3. List the major nutrient-nutrient interactions these micronutrients
4. Describe the metabolic functions and therapeutic uses of these micronutrients
5. Outline the signs and symptoms of these micronutrients deficiency, excess and toxicity
6. List the major nutrient-drug incompatibilities these micronutrients
7. Outline the recommended daily allowance and therapeutic doses for these micronutrients
8. Discuss the preferred forms for optimal uptake of these micronutrients
9. Outline the factors which affect individual requirements for these micronutrients

Material to be covered

- Review the classifications, dietary sources, metabolic functions, deficiency states, therapeutic uses, factors affecting body levels, bioavailability, recommended and therapeutic intakes, toxicity, preferred forms and recent research findings of the fat-soluble and the selection of the water-soluble vitamins

Student Required Reading

Text	Pages
Staying Healthy with Nutrition	Chapter: 5
Textbook of Natural Medicine	Chapters: 135 & 136

Additional Reading

Text	Pages
Clinical Nutrition A Functional Approach	Chapter: 5
Introduction to Human Nutrition	Chapters: 7 & 8
The Nutrient Bible	See table of contents
The World's Healthiest Foods	See table of contents

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6: Vitamins and Minerals

Aims: To provide an overview on minerals and define the specific characteristics of folic acid, biotin and vitamin C (ascorbic acid), calcium, magnesium, potassium, sodium, chloride, phosphorus and zinc

Learning Outcomes:

On successful completion you will be able to

1. Outline the dietary sources, bioavailability and interactions of these micronutrients
2. Discuss the functions, deficiency states, therapeutic uses and safety considerations that apply to these micronutrients
3. Outline appropriate dosage levels and preferred forms for micronutrients

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Name the key food sources of the given micronutrients
2. Discuss the absorption and metabolism of dietary and supplemental sources of these micronutrients
3. List the major nutrient-nutrient interactions these micronutrients
4. Describe the metabolic functions and therapeutic uses of these micronutrients
5. Outline the signs and symptoms of these micronutrients deficiency, excess and toxicity
6. List the major nutrient-drug incompatibilities these micronutrients
7. Outline the recommended daily allowance and therapeutic doses for these micronutrients
8. Discuss the preferred forms for optimal uptake of these micronutrients
9. Outline the factors which affect individual requirements for these micronutrients

Material to be covered

- Review the classifications, dietary sources, metabolic functions, deficiency states, therapeutic uses, factors affecting body levels, bioavailability, recommended and therapeutic intakes, toxicity, preferred forms and recent research findings for the selection of the water-soluble vitamins and minerals

Student Required Reading

Text	Pages
Staying Healthy with Nutrition	Chapter: 6

Additional Reading

Text	Pages
Clinical Nutrition A Functional Approach	Chapters: 5 & 6
Introduction to Human Nutrition	Chapters: 7, 8 & 9
The Nutrient Bible	See table of contents
The World's Healthiest Foods	See table of contents

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7: Minerals

Aims:

To define the characteristics of the iron, copper, selenium, iodine, manganese, molybdenum, fluoride, chromium, vanadium, bromine and trace elements.

Learning Outcomes:

On successful completion you will be able to

1. Outline the dietary sources, bioavailability and interactions of these micronutrients
2. Discuss the functions, deficiency states, therapeutic uses and safety considerations that apply to these micronutrients
3. Outline appropriate dosage levels and preferred forms for micronutrients

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Name the key food sources of the given micronutrients
2. Discuss the absorption and metabolism of dietary and supplemental sources of these micronutrients
3. List the major nutrient-nutrient interactions these micronutrients
4. Describe the metabolic functions and therapeutic uses of these micronutrients
5. Outline the signs and symptoms of these micronutrients deficiency, excess and toxicity
6. List the major nutrient-drug incompatibilities these micronutrients
7. Outline the recommended daily allowance and therapeutic doses for these micronutrients
8. Discuss the preferred forms for optimal uptake of these micronutrients
9. Outline the factors which affect individual requirements for these micronutrients

Material to be covered

- Review the classifications, dietary sources, metabolic functions, deficiency states, therapeutic uses, factors affecting body levels, bioavailability, recommended and therapeutic intakes, toxicity, preferred forms and recent research findings for the selection of minerals

Student Required Reading

Text	Pages
Staying Healthy with Nutrition	Chapter: 6

Additional Reading

Text	Pages
Clinical Nutrition A Functional Approach	Chapter: 6
Introduction to Human Nutrition	Chapter: 9
The Nutrient Bible	See table of contents
The World's Healthiest Foods	See table of contents

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8: Proteins and Amino Acids

Aims:

To provide an overview of amino acids and protein and identify their importance in human nutrition.

Learning Outcomes:

On successful completion you will be able to

1. Outline the structure, functions, dietary sources and factors affecting the bioavailability of protein and amino acids and discuss their primary roles in metabolic physiological processes

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Describe the structural characteristics of proteins
2. Describe the key functions of proteins
3. Outline the characteristics and classification of amino acids
4. List the key dietary sources and bioavailability of the essential amino acids
5. Discuss the role of amino acids in the major metabolic pathways

Material to be covered

- Major dietary sources and factors affecting bioavailability of proteins inc. soy, rice, whey, hemp
- Estimating protein requirements
- Classification of essential and non essential amino acids and role in nitrogen compounds
- The formula of the 20 common amino acids
- Metabolic pathways reliant on amino acids
 - Cysteine, methionine and betaine in the sulfation cycle
 - Taurine and glycine in amino acid conjugation
 - Arginine, ornithine and citrulline in signal transduction
 - Branched chain amino acids
 - Creatine and carnitine in mitochondrial function
 - Glutamine/glutamate
- Processes by which amino acids are degraded – urea cycle
- Glycoproteins and proteoglycans

Student Required Reading

Text	Pages
Staying Healthy with Nutrition	Chapter: 3
Textbook of Natural Medicine 4th edition	Chapters: 74, 94 & 95

Additional Reading

Text	Pages
Clinical Nutrition A Functional Approach	41-67
Introduction to Human Nutrition	Chapter: 4
The Nutrient Bible	See table of content

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9: Lipids and Essential Fatty Acids (EFAs)

Aims:

To provide an overview and define the specific characteristics of lipids and fatty acids, including EFAs.

Learning Outcomes:

On successful completion you will be able to:

1. Describe the structural characteristics of lipids and fatty acids
2. Outline the dietary sources, function, bioavailability and metabolism of fatty acids, including EFAs
3. Discuss the deficiency states, therapeutic uses and safety considerations that apply to EFAs

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. List the dietary sources of lipids and the factors affecting bioavailability
2. Outline the characteristic, functions and classification of lipids and fatty acids including EFAs
3. Outline the role of EFAs in inflammatory processes
4. Outline appropriate dosage levels and preferred forms for optimal intake of EFAs

Material to be covered

- Sources, terminology used, characteristics and regulation of dietary fats – SFA, USFA, short, medium and long chain FA, MUFA, PUFA, hydrogenated, conjugated, triglycerides, phospholipids and sterols
- EFAs metabolism - emulsification, lipolysis, solubilisation, absorption; b-oxidation, ketogenesis, ketosis; peroxidation, desaturation, hydrogenation
- Body lipid pools
- Eicosanoids
- Arachidonic acid cascade and role of EFAs
- Lipid protection - vitamins
- Cholesterol synthesis and regulation

Student Required Reading

Text	Pages
Staying Healthy with Nutrition	Chapter: 4
Textbook of Natural Medicine 4 th Ed	Chapter: 91

Additional Reading

Text	Pages
Clinical Nutrition A Functional Approach	69-96
Dietary Fats and Fatty Acids in Human Healthcare	All
Fats that Heal, Fats that Kill.	All
Introduction to Human Nutrition	Chapter: 6
The Nutrient Bible	See table of contents

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10: Food Labeling, Composition Tables and Dietary Assessment

Aims:

- To explore key aspects of food composition and classification tables
- To examine methods of determining food composition and their limitations
- To examine the Dietary Reference Values
- To provide tools to assess daily dietary intake and design a therapeutic menu plan.

Learning Outcomes:

On successful completion you will be able to:

1. Review the various methods used for nutrient classification
2. Describe the importance of dietary reference values
3. Outline methods of dietary assessment used in nutritional therapy
4. Outline the different options for menu planning for clients of nutritional therapy

Assessment Criteria

To achieve the learning outcome you must demonstrate the ability to:

1. Apply the use of food composition and classification tables to help measure the nutrient status of foods and daily food intake.
2. Explain the function of Dietary Reference Values and assess the individual considerations that determine their relevance and usefulness in clinical practice.
3. Analyse and evaluate food intake both macronutrients and micronutrients using manual or electronic means.
4. Discuss how to construct menu plans which meet negotiated therapeutic goals.

Material to be covered

Food Composition and Classification, Dietary Reference Values & Dietary Assessment

- Food composition tables and food labels
- Use of The Composition of Foods
- Glycaemic index and glycaemic load tables
- History of and calculation methods of DRV
- Strengths and limitation of use in clinical practice
- Manual assessment of food intake ie food diary, client recall, questionnaires
- Computer based assessment of food intake.
- Factors a practitioner must take into consideration when assessing a food diary.
- Factors affecting the implementation of therapeutic and wellness menu plans.
- Explore a range of food choices and alternatives.

Additional Reading

Text	Pages
Introduction to Human Nutrition	Chapters: 7, 10 &11
The Composition of Foods: Summary Edition (6th Edition)	See table of contents