<table>
<tr><td>Course title</td><td colspan="5">Nutrition and Metabolism</td></tr>
<tr><td>Course code</td><td colspan="5">GEMD-103</td></tr>
<tr><td>Course type</td><td colspan="5">Required</td></tr>
<tr><td>Level</td><td colspan="5">Undergraduate</td></tr>
<tr><td>Year / Semester</td><td colspan="5">Year 1, Semester 2</td></tr>
<tr><td>Teacher’s name</td><td colspan="5">Dr Chloe Antoniou</td></tr>
<tr><td rowspan="3">ECTS</td><td rowspan="3">13</td><td colspan="4">Teaching Periods per Week</td></tr>
<tr><td>Large Group Learning</td><td>Small Group Learning</td><td>Laboratories & Skills</td><td>Clinical Practice</td></tr>
<tr><td>8</td><td>6</td><td>2</td><td>4</td></tr>
<tr><td>Course purpose and objectives</td><td colspan="5">The aim of this course is:
• to provide students with a detailed understanding of the structure and function of key biomolecules, as well as an in-depth comprehension of their metabolism.
• to understand the relationship between diet, exercise and weight and what comprises a healthy diet, including the importance of vitamins.
• to explain the causes and discuss the management of malnutrition</td></tr>
<tr><td>Learning outcomes</td><td colspan="5">At the end of the course the student will be able to:

Knowledge
1. Describe the nutritional components that make up a balanced healthy diet
2. Discuss the role of the family in promoting a healthy diet
3. Discuss the role of the Government in promoting a healthy diet.
4. Explain the utility of the labelling of ingredients on food products.
5. Explain food hygiene processes and their relationship to maintaining the health of the population
6. Define the concept of “One Health” and appreciate its importance in clinical medicine
7. Discuss the role of nutrition and healthy eating in the One Health initiative
8. Define the terms outbreak, endemic, epidemic and pandemic.
9. Describe the biochemical pathways involved in the intermediary metabolism of carbohydrates, lipids and amino acids.
10. Define the term Basal Metabolic Rate (BMR) and explain the factors which affect BMR.
11. Compare and contrast the intermediary metabolic processes taking place after meals, between meals and during fasting/starvation and explain how these processes are regulated
12. Compare and contrast energy metabolism in skeletal muscle, cardiac muscle and the brain.
13. Compare and contrast aerobic and anaerobic metabolism in muscle.
14. Explain how aerobic training allows muscles to sustain endurance exercise
15. Explain how exhaustion is linked to fuel switching
16. Discuss Body Mass Index (BMI).</td></tr>
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	17. Classify the main types of malnutrition and give examples of how these might arise. 18. Discuss the common causes and consequences (worldwide) of obesity and overweight 19. Discuss the impact of the rising incidence of obesity on the health of nations. 20. Explain the role of vitamins in health 21. Describe common vitamin deficiencies and toxicities and list common signs indicating vitamin deficiency 22. Describe the sources and functions of the major vitamins and discuss examples of metabolic reactions that require them 23. Discuss the role of cholesterol in health and disease and outline ways in which cholesterol levels can be regulated, including through the use of statins. 24. Discuss the relationship between diet, exercise and weight 25. Discuss the psychosocial benefits of exercise 26. Discuss the relationship between body image and self-esteem and explain how this is linked to attitudes to diet and exercise 27. Introduce culinary medicine and its relationship to clinical practice. 28. Describe the concept of embodiment. 29. Describe medicalisation of obesity. 30. Identify and describe public health interventions for the prevention obesity. 31. Outline the fundamental principles of carbohydrate, protein and lipid structure. 32. Discuss glucose entry in cells. 33. Outline insulin receptor signaling and □-adrenergic receptor signalling. 34. Define glycemic index. 35. Discuss the biochemical basis of inborn errors of metabolism, such as G6PD, phenylketonuria and many others. 36. Discuss laboratory investigations for inborn errors of metabolism. 37. Demonstrate the fundamental components of a whole food, plant-based diet such as the traditional Mediterranean diet. 38. Understand local products that can facilitate the creation of healthy whole food, plant-based recipes. 39. To be aware of WHO Dietary Guidelines on healthy eating 40. To discuss the characteristics of the most common dietary patterns followed by populations or individuals including: 41. Western' diet, Mediterranean diet, Vegetarian/vegan diets, ketogenic diet, intermittent fasting 42. To discuss the most important risks and benefits of each dietary pattern. 43. To discuss important research findings conducted relevant for each dietary pattern. 44. To appreciate that health effects of nutrition are affected by many factors. 45. Discuss how genetics are related to nutrition e.g the genetics behind lactose intolerance, diabetes etc. 46. Describe how ethanol is metabolized in cells and discuss the genetic causes of "alcohol flushing". 47. Discuss the metabolic consequences of chronic alcohol use. ***Skills*** 48. Carry out a clinical assessment of the nutritional status (including BMI) and use the result to determine the nutritional status of the subject 49. Discuss the elements of a dietary history from a patient. 50. Develop a programme to educate children in the need for a healthy balanced diet

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<tr><td></td><td colspan="3">51. Take part in visits to local schools to explain the importance of a healthy balanced diet and critically reflect on the outcomes of such visits – e.g. what (if anything) might they have achieved in the short-term, medium-term and long-term.
52. Carry out an RFLP analysis on genomic DNA isolated from saliva in order to determine the SNP status of a common polymorphism related to lactose intolerance.

Professional competencies
53. Recognise the need to maintain a personal healthy lifestyle
54. Discuss the role of health professionals in raising awareness and influencing public and individual attitudes to exercise and healthy diet
55. Evaluate the role of sports medicine in promoting healthy lifestyle
56. Discuss the role of health professionals promoting healthy lifestyles and managing malnutritional states
57. Discuss the importance of good communication within the MDT when managing dietary issues and eating disorders.</td></tr>
<tr><td>Prerequisites</td><td>None</td><td>Required</td><td>None</td></tr>
<tr><td>Course content</td><td colspan="3">• The nature of a healthy diet
• Macromolecule structure and function
• Intermediary metabolism
• Malnutrition
• Energy storage and usage
• Exercise and its benefits
• Vitamins and vitamin deficiencies
• Body image and self esteem</td></tr>
<tr><td>Teaching methodology</td><td colspan="3">Lectures – normally two face-to-face, two on-line p/week
Tutorials – two case-based learning small group sessions, two expert-led class discussions/debates
Flipped classroom activities
Community and/or hospital visits each week, relating to the case of the week
Student centred learning/self-study</td></tr>
<tr><td>Bibliography</td><td colspan="3">Required textbooks/reading
<table>
<tr><th>Authors</th><th>Title</th><th>Edition</th><th>Publisher</th><th>Year</th><th>ISBN</th></tr>
<tr><td>David L. Nelson and Michael M. Cox</td><td>Lehninger Principles of Biochemistry</td><td>8th edition (international)</td><td>W. H. Freeman and Company</td><td>2021</td><td>978-1319381493 (paperback)</td></tr>
<tr><td>World Health Organisation</td><td>Fact Sheets: Healthy Diet Obesity and Overweight Malnutrition</td><td></td><td>On-line</td><td>2021</td><td>https://www.who.int/news-room/fact-sheets</td></tr>
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		Salt Reduction				

Recommended textbooks/reading

Authors	Title	Edition	Publisher	Year	ISBN
Jason Fung	The obesity code: unlocking the secrets of weight loss	1st edition	Greystone Books	2016	9781771641258

Assessment	The course will be assessed at the end of Semester 2 with a Summative Final Examination consisting of Single Best Answer MCQs (SBAs) and Short Answer Questions (SAQs).
Language	English