MODULE AND DISSERTATION OUTLINES FOR THE POSTGRADUATE STUDY PROGRAMME

"MSc in Children's Health & Wellbeing: Exercise, Nutrition & Digital Technologies"

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Term 1/Year 1 Modules

Core Modules

UOEHUA001 - Children's Physical Activity and Health

1. GENERAL

SCHOOL	University of Exeter Medical School		
ACADEMIC UNIT	Department of Public Health and Sport Sciences		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	UOEHUA001	**SEMESTER**	1st Semester of Full-Time (FT) 1st Year of Part-Time (PT)
COURSE TITLE	Children's Physical Activity and Health		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	The course provides specialised knowledge in exercise physiology, growth and maturation, physical activity promotion and exercise prescription in children and adolescents.		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.* *Consult Appendix A* • *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*

- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

Knowledge

- Explain physiological and developmental characteristics of children and adolescents relevant to exercise participation.
- Describe the health benefits of physical activity during childhood and adolescence.
- Analyse the role of physical activity in the prevention of obesity and chronic diseases.
- Evaluate current international physical activity guidelines for youth populations.

Skills

- Design evidence-based exercise programmes for children and adolescents.
- Interpret scientific literature related to physical activity, fitness and health in youth.
- Apply appropriate assessment methods for physical fitness and physical activity in children.

Competences

- Integrate exercise science principles with nutrition and public health strategies.
- Develop interventions promoting physical activity in school and community settings.
- Communicate scientific knowledge effectively to multidisciplinary audiences.

Learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
…….

Search, analysis and synthesis of data and information with the use of necessary technologies
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility
Criticism and self-criticism
Production of creative and inductive thinking

3. COURSE SYLLABUS

This course introduces students to the scientific foundations of exercise participation and performance in children and adolescents and explores how physical activity contributes to health and disease prevention.
Key topics include
Week 1:

- Introduction to youth physical activity
- Importance of exercise during childhood
- Epidemiology of physical inactivity

Week 2:

- Growth and maturation

- Growth patterns
- Biological vs chronological age

Week 3:

- Physiological responses to exercise
- Cardiovascular responses
- Metabolic responses

Week 4:

- Neuromuscular development
- Motor development
- Coordination and strength

Week 5:

- Aerobic fitness in youth
- Measurement methods
- VO_2max development

Week 6:

- Strength training in children
- Resistance training guidelines
- Safety considerations

Week 7:

- Physical activity guidelines
- WHO recommendations
- International policies

Week 8:

- Measurement of physical activity
- Accelerometers
- Questionnaires
- Fitness testing

Week 9:

- Exercise and obesity prevention
- Lifestyle interventions
- Behaviour change strategies

Week 10:

- Exercise and mental health
- Psychological benefits of physical activity
- Wellbeing in youth

Week 11:

- Physical literacy
- Motor competence
- Long-term athlete development

Week 12:

- Exercise prescription
- Designing youth exercise programmes

Week 13:

- Applied case studies
- School-based interventions
- Community programmes

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching. Teaching includes: • live online lectures • recorded lectures • interactive discussion sessions • case-based learning • independent study

	These activities are supported through the university's digital platforms for teleconferencing and asynchronous learning.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through: • weekly synchronous sessions • course discussion forums • email communication • scheduled virtual office hours • announcements on the digital learning platform
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through: • group discussion during live sessions • collaborative assignments • online discussion forums • digital collaborative tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: Teleconference platform (Microsoft Teams) Asynchronous learning platform (Moodle) Collaborative digital tools Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	

Activity	*Semester workload*
Synchronous lectures	31
Asynchronous recorded lectures	8
Study of lecture materials	60
Literature reading	30
Preparation of assignments	35
Assignment writing	20
Exam preparation	16
Course total	*200 hours*

STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other*	**Description of the assessment method** Assessment of the course is designed to evaluate students' ability to critically analyse scientific evidence, apply theoretical knowledge to practical contexts, and communicate scientific information effectively. The assessment strategy combines formative and summative assessment methods and includes written analytical work, application-based assignments and

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

recorded presentations. All assessment is conducted in English.
The assessment approach emphasises critical thinking, evidence-based reasoning and applied knowledge, rather than factual recall.

Assessment methods include:

- analytical written report
- literature review
- recorded oral presentation
- critical evaluation of scientific literature
- problem-solving tasks
- participation in online learning activities

Assessments	Weight
Applied scientific report (journal article format) + recorded presentation	70%
Applied case study / data interpretation task	30%

Description of assessment tasks
Applied scientific report and presentation (70%)
Students prepare a **scientific report in journal-article format (2000 words)** describing an evidence-based physical activity or exercise programme for children or adolescents.
The report includes:
• Abstract
• Introduction
• Methods / programme design
• Expected outcomes
• Discussion
• References
Students also submit a **10-minute recorded presentation** summarising the key elements of the project and explaining the scientific rationale for the proposed intervention.

Applied case study / data interpretation task (30%)
Students complete a short, applied task analysing a real-world scenario related to physical activity, exercise or health in children and adolescents.
The task may involve:

- interpretation of physical activity or fitness data
- analysis of a youth sport or health intervention scenario
- development of evidence-based recommendations.

Submission format:
1000-word structured analysis report.

Evaluation criteria
Student performance is evaluated according to the following criteria:

- quality and relevance of scientific literature

	• critical analysis and evaluation of evidence • application of knowledge to programme design • interpretation of data or case study • clarity and structure of written work • quality of presentation and communication. **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester. Students receive written feedback following submission of each assessment.

5. RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

The following textbooks and guidelines provide an overview of the scientific principles and applied practices related to exercise, physical activity and health in children and adolescents. Additional scientific articles will be provided throughout the course.

Physical Activity Guidelines

- *World Health Organization (WHO)*
  Global Guidelines on Physical Activity and Sedentary Behaviour (2020)
  https://www.who.int/publications/i/item/9789240015128
- *American College of Sports Medicine (ACSM)*
  ACSM's Guidelines for Exercise Testing and Prescription (11th edition)
  https://www.acsm.org
- *U.S. Department of Health and Human Services*
  Physical Activity Guidelines for Americans (2nd edition)
  https://health.gov/our-work/nutrition-physical-activity/physical-activity-guidelines
- *International Society for Physical Activity and Health (ISPAH)*
- *Global Physical Activity Guidelines and advocacy resources*
- *https://www.ispah.org*

Youth Exercise and Athlete Development Guidelines

- *International Olympic Committee (IOC)*
  IOC Consensus Statement on Youth Athletic Development
  https://bjsm.bmj.com/content/49/13/843
- *National Strength and Conditioning Association (NSCA)*
  Position Statement on Youth Resistance Training
  https://www.nsca.com
- *UK Chief Medical Officers*
  Physical Activity Guidelines for Children and Young People
  https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report
- *Canadian Society for Exercise Physiology (CSEP)*
  Canadian 24-Hour Movement Guidelines for Children and Youth
  https://csepguidelines.ca

Public Health and Physical Activity Surveillance

- Active Healthy Kids Global Alliance (AHKGA)
  Global Matrix Report Cards on Physical Activity for Children and Youth
  https://activehealthykids.org
- Global Observatory for Physical Activity (GoPA!)
  Global physical activity country profiles and surveillance data
  https://www.globalphysicalactivityobservatory.com
- OECD – Health and Physical Activity Indicators
  https://www.oecd.org/health

Physical Activity Measurement

- ActiGraph Research Tools
  Accelerometer-based physical activity measurement
  https://actigraphcorp.com
- Global Physical Activity Questionnaire (GPAQ)
  WHO physical activity measurement tool
  https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/gpaq
- International Physical Activity Questionnaire (IPAQ)
  https://sites.google.com/view/ipaq

Fitness and Health Assessment

- EUROFIT Fitness Testing Battery
  European youth physical fitness testing protocol
  https://www.coe.int/en/web/sport/eurofit
- ALPHA Fitness Test Battery
  https://www.healthevidence.org
- FitnessGram / Cooper Institute
  School-based youth fitness assessment
  https://fitnessgram.net

Youth Development and Sport Pathways

- Long-Term Athlete Development (LTAD)
  Sport Canada model
  https://sportforlife.ca
- UK Youth Physical Development Model
  https://www.uksca.org.uk

Behaviour Change and Intervention Tools

- WHO Health Promoting Schools Framework
  https://www.who.int/health-topics/health-promoting-schools
- CDC Youth Physical Activity Toolkit
  https://www.cdc.gov/healthyschools/physicalactivity
- Global Action Plan on Physical Activity (WHO)
  https://www.who.int/publications/i/item/9789241514187

Books

- *Armstrong, N., & Van Mechelen, W. (2023).* ***Oxford Textbook of Children's Sport and Exercise Medicine (4th ed.)****. Oxford University Press.*
- *Malina, R. M., Bouchard, C., & Bar-Or, O. (2004).* ***Growth, Maturation and Physical Activity (2nd ed.)****. Human Kinetics.*
- *Faigenbaum, A. D., & Myer, G. D. (2020).* ***Youth Resistance Training: Concepts and Applications****. Human Kinetics.*
- *Lloyd, R. S., & Oliver, J. L. (2019).* ***Strength and Conditioning for Young Athletes: Science and Application****. Routledge.*
- *Rowland, T. W. (2017).* ***Children's Exercise Physiology (2nd ed.)****. Human Kinetics.*

Students should consult:

- PubMed – https://pubmed.ncbi.nlm.nih.gov
- SPORTDiscus – https://www.ebsco.com
- Web of Science – https://www.webofscience.com
- Scopus – https://www.scopus.com

UOEHUA002 - From Infancy to Adolescence: Clinical Nutrition in Practice

1. GENERAL

SCHOOL	University of Exeter Medical School		
ACADEMIC UNIT	Department of Public Health and Sport Sciences		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	UOEHUA002	SEMESTER	1st Semester of Full-Time (FT) 1st Year of Part-Time (PT)
COURSE TITLE	From Infancy to Adolescence: Clinical Nutrition in Practice		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	The course provides general knowledge in paediatric clinical nutrition, including growth and development, nutritional assessment, and the role of nutrition in supporting health and clinical outcomes in children and adolescents.		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

Knowledge

- **Explain** the relationship between nutrition, growth, and development from infancy through to young adulthood, including key physiological and developmental determinants of healthy growth.
- **Describe** methods for nutritional screening and assessment in children and adolescents, including anthropometric, dietary, and clinical measures.
- **Analyse** the role of nutrition in the prevention of chronic conditions in childhood and adolescence, including obesity and cardiometabolic risk.
- **Evaluate** current international nutrition guidelines for infants, children and youth populations (for the prevention and/or treatment of chronic conditions).
- **Critically appraise** nutritional challenges and requirements in paediatric conditions, including feeding difficulties (e.g. fussy eating), neurodevelopmental conditions (e.g. ASD), food allergies and intolerances, respiratory conditions (e.g. cystic fibrosis) and other relevant conditions.

Skills

- **Apply** appropriate nutritional screening and assessment tools to evaluate nutritional status in children and adolescents.
- **Interpret** scientific literature related to paediatric clinical nutrition and its impact on growth, health, and disease outcomes.
- **Design** evidence-based nutritional strategies and interventions to support healthy growth and manage common paediatric conditions.

Competences

- **Integrate** clinical nutrition principles with multidisciplinary approaches to support the health and wellbeing of children and adolescents.
- **Develop** nutrition-focused interventions for the prevention and management of paediatric health conditions in clinical and community settings.
- **Communicate** complex nutritional concepts effectively to children, families, and multidisciplinary teams.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
… …
Other…
… …

Search, analysis and synthesis of data and information with the use of necessary technologies
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility
Criticism and self-criticism
Production of creative and inductive thinking

3. COURSE SYLLABUS

This course introduces students to the scientific foundations of exercise participation and performance in children and adolescents and explores how physical activity contributes to health and disease prevention.

Key topics include

Week 1 — Nutrition in Pregnancy and Early Life
- Maternal nutrition and foetal development
- Early nutritional programming and developmental origins of health and disease (DOHaD)

Week 2 — Nutrition in Infancy
- Breastfeeding, formula feeding, and complementary feeding
- Nutritional requirements and growth in infancy

Week 3 — Nutrition in Childhood
- Dietary requirements and healthy eating patterns
- Establishing eating behaviours and dietary habits

Week 4 — Nutrition in Adolescence and Young Adulthood
- Puberty, growth spurts, and nutritional needs
- Lifestyle influences and risk behaviours

Week 5 — Nutritional Screening and Assessment in Paediatrics
- Growth monitoring (growth charts, z-scores, BMI-for-age)
- Dietary assessment methods, clinical indicators and applied behaviour change

Week 6 — Body Composition and Nutritional Status
- Methods of assessing body composition (e.g. skinfolds, BIA, DXA)
- Identification of undernutrition and overnutrition

Week 7 — Paediatric Obesity and Weight Management
- Aetiology and epidemiology of childhood obesity
- Evidence-based weight management and behavioural strategies

Week 8 — Nutrition for Prevention of Chronic Conditions
- Cardiometabolic health and early risk factors
- Role of diet in long-term disease prevention

Week 9 — Nutrition in Feeding Difficulties and Fussy Eating
- Development of feeding behaviours (e.g. children with ASD)
- Management strategies for feeding difficulties

Week 10 — Nutrition and Bone Health
- Key nutrients (calcium, vitamin D, protein)
- Peak bone mass and long-term implications

Week 11 — Nutrition in Allergic Conditions and Intolerances
- Aetiology, pathophysiology and epidemiology
- Nutritional management of food intolerances, allergies and coeliac disease

Week 12 — Nutrition in Gastrointestinal Diseases
- Aetiology, pathophysiology, medical treatment and epidemiology
- Nutritional management

Week 13 — Nutrition in Complex Clinical Conditions
- Aetiology, pathophysiology, medical treatment and epidemiology
- Nutrition in paediatric oncology

Week 14 — Applied Case Studies in Paediatric Clinical Nutrition
- Integrated case-based discussions
- Multidisciplinary approaches to nutrition care

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching. Teaching includes: • live online lectures • recorded lectures • interactive discussion sessions • case-based learning • independent study These activities are supported through the university's digital platforms for teleconferencing and asynchronous learning.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through: • weekly synchronous sessions • course discussion forums • email communication • scheduled virtual office hours • announcements on the digital learning platform
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through: • group discussion during live sessions • collaborative assignments • online discussion forums • digital collaborative tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: Teleconference platform (Microsoft Teams) Asynchronous learning platform (Moodle) Collaborative digital tools Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography,*	<table><tr><th>*Activity*</th><th>*Semester workload*</th></tr><tr><td>Synchronous lectures</td><td>13</td></tr></table>

tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.

The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.

Asynchronous recorded lectures	26
Study of lecture materials	60
Literature reading	30
Preparation of assignments	35
Assignment writing	20
Exam preparation	16
Course total	*200 hours*

STUDENT ASSESSMENT

Description of the assessment method

Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Description of the assessment method

Assessment of the course is designed to evaluate students' ability to critically analyse scientific evidence, apply theoretical knowledge to practical contexts, and communicate scientific information effectively.

The assessment strategy combines formative and summative assessment methods and includes written analytical work, application-based assignments and recorded presentations. All assessment is conducted in English.

The assessment approach emphasises critical thinking, evidence-based reasoning and applied knowledge, rather than factual recall.

Assessment methods include:

- analytical written report
- literature review
- recorded oral presentation
- critical evaluation of scientific literature
- problem-solving tasks
- participation in online learning activities

Assessments	**Weight**
Applied scientific report (journal article format) + recorded presentation	**70%**
Applied clinical case study / Assessment, Nutrition Care Plan task	**30%**

Description of assessment tasks

Applied scientific report and presentation (70%)

Students prepare a **scientific report in journal-article format (2000 words)** describing an evidence-based nutrition intervention for either prevention or management of a chronic condition in children or adolescents.

The report includes:

- Abstract
- Introduction
- Methods / programme design
- Expected outcomes
- Discussion
- References

Students also submit a **10-minute recorded presentation** summarising the key elements of the project and explaining the scientific rationale for the proposed intervention.

	Applied case study / data interpretation task (30%) Students complete a short, applied task analysing a real-world scenario related to nutritional assessment and management of a chronic condition in a single case study involving a child, adolescent or young adult. The task may involve: ● Appropriate nutritional status assessment ● Evidenced base diagnosis ● Evidence-based nutritional recommendations and/or intervention. Submission format: 1000-word structured analysis report. **Evaluation criteria** Student performance is evaluated according to the following criteria: ● quality and relevance of scientific literature ● critical analysis and evaluation of evidence ● application of knowledge to programme design ● interpretation of data or case study ● clarity and structure of written work ● quality of presentation and communication. **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester. Students receive written feedback following submission of each assessment.

5. RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

The following textbooks and guidelines provide an overview of the scientific principles and applied practices related to exercise, physical activity and health in children and adolescents. Additional scientific articles will be provided throughout the course.

Nutritional Guidelines and Reference Standards

- **World Health Organization (WHO)**
  Guideline: Updates on the Management of Severe Acute Malnutrition in Infants and Children (2013)
  https://www.who.int/publications/i/item/9789241506328
- **World Health Organization (WHO)**
  Child Growth Standards (2006) & Growth Reference (5–19 years)
  https://www.who.int/tools/child-growth-standards
- **Scientific Advisory Committee on Nutrition (SACN)**
  Dietary Reference Values for Energy (2011) and Children (various reports)
  https://www.gov.uk/government/collections/sacn-reports
- **European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN)**
  Position papers and clinical guidelines (infant feeding, micronutrients, clinical conditions)
  https://www.espghan.org
- **National Institute for Health and Care Excellence (NICE)**
  Nutrition support for adults and children; obesity and related guidelines, https://www.nice.org.uk

Energy Requirements, Dietary Reference Values an body composition references

- Wells, J. C. K. (2006). Measuring body composition. Archives of Disease in Childhood, 91(7), 612–617.
- Wells, J. C. K., Williams, J. E., Chomtho, S., et al. (2012). Body-composition reference data for simple and reference techniques and a 4-component model: a new UK reference child. American Journal of Clinical Nutrition, 96(6), 1316–1326.
- Wells, J. C. K., Davies, P. S. W., Fewtrell, M. S., & Cole, T. J. (2019). Body composition reference charts for UK infants and children aged 6 weeks to 5 years. European Journal of Clinical Nutrition, 74, 141–148.
- Wells, J. C. K. (2019). Body composition of children with moderate and severe undernutrition and after treatment: a narrative review. BMC Medicine, 17, 215.
- Henry, C. J. K. (2005)
  Basal metabolic rate studies in humans: measurement and development of new equations
  Public Health Nutrition, 8(7A), 1133–1152
- **Scientific Advisory Committee on Nutrition (SACN)**
  Dietary Reference Values for Energy (2011)
  - https://www.gov.uk/government/publications/sacn-dietary-reference-values-for-energy
- **Institute of Medicine (IOM)**
  Dietary Reference Intakes (DRIs) for Energy, Macronutrients and Micronutrients
  https://www.nationalacademies.org
- **FAO/WHO/UNU**
  Human Energy Requirements Report (2004)
  https://www.fao.org

Infant, Child and Adolescent Nutrition

- **Worldwide Dietary Guidelines FAO**
  https://www.fao.org/nutrition/education/dietary-guidelines/regions/en/
- **Public Health England / UK Government**
  The Eatwell Guide and Infant Feeding Guidance
  https://www.gov.uk/government/publications/the-eatwell-guide
- **UNICEF UK Baby Friendly Initiative**
  Infant feeding and breastfeeding standards
- https://www.unicef.org.uk/babyfriendly
- **British Dietetic Association (BDA)**
  Food Fact Sheets and paediatric nutrition resources
  https://www.bda.uk.com
- **American Academy of Pediatrics (AAP)**
  Pediatric nutrition guidance and policy statements
  https://www.aap.org

Nutritional Screening and Assessment

- **Royal College of Paediatrics and Child Health (RCPCH)**
  UK-WHO Growth Charts and guidance
  https://www.rcpch.ac.uk
- **British Association for Parenteral and Enteral Nutrition (BAPEN)**
  Paediatric Malnutrition Screening Tool (PYMS)
  https://www.bapen.org.uk
- **European Society for Clinical Nutrition and Metabolism (ESPEN)**
  Guidelines on clinical nutrition and hydration in paediatrics
  https://www.espen.org

Obesity and Chronic Disease Prevention

- **World Health Organization (WHO)**
  Report of the Commission on Ending Childhood Obesity (2016)
  https://www.who.int/publications/i/item/9789241510066

- **National Institute for Health and Care Excellence (NICE)**
  Obesity: Identification, assessment and management (CG189)
  https://www.nice.org.uk/guidance/cg189
- **Centres for Disease Control and Prevention (CDC)**
  Childhood obesity and healthy weight resources
- https://www.cdc.gov/obesity

Clinical Conditions in Paediatric Nutrition

- **European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN)**
  Guidelines on coeliac disease, food allergy, and GI conditions
  https://www.espghan.org
- **Cystic Fibrosis Trust (UK)**
  Nutritional management of cystic fibrosis
  https://www.cysticfibrosis.org.uk
- **International Society of Paediatric Oncology (SIOP)**
  Supportive care and nutrition in paediatric oncology
  https://siop-online.org
- **British Society for Allergy & Clinical Immunology (BSACI)**
  Guidelines for food allergy management
  https://www.bsaci.org

Bone Health and Micronutrients

- **Scientific Advisory Committee on Nutrition (SACN)**
  Vitamin D and Health Report (2016)
  https://www.gov.uk/government/publications/sacn-vitamin-d-and-health-report
- **International Osteoporosis Foundation (IOF)**
  Bone health resources across the lifecourse
  https://www.osteoporosis.foundation

Behaviour, Feeding and Neurodevelopment

- **National Autistic Society (UK)**
  Eating behaviours and nutrition in autism
  https://www.autism.org.uk
- **NHS UK**
  Fussy eating and feeding advice for children
  https://www.nhs.uk

Books

- **Koletzko, B., et al. (2021).** *Pediatric Nutrition in Practice* (3rd ed.). Karger.
- **Shaw, V. (2020).** *Clinical Paediatric Dietetics* (5th ed.). Wiley-Blackwell.
- **Corkins, M. R. (Ed.). (2015).** *The ASPEN Pediatric Nutrition Support Core Curriculum* (2nd ed.). ASPEN.
- **Agostoni, C., & Brunetti, L. (2019).** *Nutrition in Childhood.* Springer.
- **Suskind, D. L., & Duggan, C. (2014).** *Pediatric Nutrition.* PMPH USA.

Students should consult:

- PubMed – https://pubmed.ncbi.nlm.nih.gov
- SPORTDiscus – https://www.ebsco.com
- Web of Science – https://www.webofscience.com
- Scopus – https://www.scopus.com

HUAUOE006 - Biostatistics, Research Methodology & Ethics

1. GENERAL

SCHOOL	School of Health Science and Education, Harokopio University		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE006	**SEMESTER**	1st Semester of Full-Time (FT) 1st Year of Part-Time (PT)
COURSE TITLE	Biostatistics, Research Methodology & Ethics		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	General quantitative background		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous distance learning is delivered through a leading collaboration platform, while asynchronous learning is delivered through the HUA Moodle learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.* *Consult Appendix A* • *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area* • *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B* • *Brief Guide for drafting Learning Outcomes*
The course introduces the fundamental principles for the design, analysis and interpretation of

studies in biomedical and public health research. Students will develop a solid foundation in the use of statistical methods for analyzing biological data, evaluating evidence, and drawing valid scientific conclusions. The course also emphasizes the ethical standards governing research involving human participants, data integrity, and responsible reporting. By combining methodological rigor with ethical awareness, the course equips students to conduct transparent, reproducible, and socially responsible research that contributes to improved health outcomes and evidence-based decision-making in medicine and public health.

Upon successful completion of the course students are expected to have developed:

- A comprehensive Understanding of core biostatistical principles relevant to biomedical and public health research.
- Proficiency in study design, including both experimental and observational approaches.
- Competence in data analysis and interpretation using appropriate statistical methods and software (Introduction to R and STATA through guided labs using real-world datasets).
- The Ability to critically evaluate scientific literature and assess the validity of research findings.
- Knowledge of research ethics, including informed consent, confidentiality, and responsible data management.
- Awareness of ethical challenges in biomedical research and strategies to address them.
- The ability to communicate statistical findings clearly in both written and oral scientific formats.
- A Commitment to integrity, transparency, and reproducibility in research practice.

Knowledge

Students will be able to:

- Explain the methodological characteristics of different biomedical and public health studies.
- Describe, apply and interpret commonly used statistical methods in research.

Skills

Students will develop the ability to:

- Design appropriate biomedical and public health studies, including selecting suitable methodologies and sampling strategies.
- Critically evaluate scientific literature and interpret research findings.
- Apply ethical principles in research involving human data, ensuring confidentiality, integrity, and responsible conduct.
- Present statistical results and research findings clearly in written and oral scientific communications.

Competences

Students will demonstrate the capacity to:

- Apply appropriate statistical techniques for the analysis and interpretation of biomedical and public health data.
- Incorporate ethical principles and standards into the design, implementation, and reporting of biostatistical research.
- Synthesize statistical evidence and research findings to inform clinical or public health decision-making.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism

Working in an international environment *Working in an interdisciplinary environment* *Production of new research ideas*	*Production of free, creative and inductive thinking* *… …* *Other…* *… …*
Search, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Production of new research ideas Criticism and self-criticism Production of creative and inductive thinking	

3. COURSE SYLLABUS

The course introduces the fundamental principles of biostatistical methods and ethics in biomedical and public health research. The students will explore key concepts in study design, data collection, statistical analysis, and interpretation of health-related data. The course also addresses ethical considerations in research practice, including the protection of human participants, data confidentiality, research integrity, and transparent reporting. By combining theoretical foundations with practical applications, students will develop the skills to critically evaluate scientific evidence and apply appropriate statistical methods while adhering to ethical standards in health research.

Key topics include

- Fundamentals of Research Methodology
- Research Ethics and Data Protection
- Causation, Causal Inference and Bias
- Study Design; Observational & Interventional studies
- Measures of Disease Frequency and Data Visualization
- Measures of Effect and Measures of Association
- Fundamentals of Statistical Analysis and Inference
- Hypothesis Testing
- Regression Analysis and Model Building; Continuous Outcomes
- Categorical Data Analysis and Regression
- Survival Analysis and Modeling
- Meta-Analysis and Evidence Synthesis

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Student communication is conducted through a structured combination of synchronous and asynchronous methods, supported by digital technologies and the HUA online learning platform (Moodle). This includes scheduled weekly live (synchronous) sessions, designated virtual office hours, and regular interaction through course discussion forums and electronic correspondence. In addition, course announcements and learning materials are systematically uploaded on the Moodle platform, ensuring organized communication throughout the duration of the course.
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is facilitated through the following channels: • Group discussion during live sessions • Collaborative assignments • Online discussion forums • Digital collaborative tools

USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	The following ICT tools are used to support teaching, communication and assessment: ● The collaboration platform Microsoft Teams for synchronous sessions ● The HUA Asynchronous learning platform (Moodle) ● Online assessment systems for administering examinations
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have access to the following: ● A computer (desktop or laptop) ● A reliable internet connection ● A webcam and microphone ● Access to the HUA digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	Submitted assignments are subject to review through plagiarism detection software (e.g. Turnitin). Any form of Academic misconduct may result in disciplinary action in accordance with University regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is permitted only when explicitly acknowledged and appropriately referenced. Students bear full responsibility for the originality and integrity of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	

Activity	*Semester workload (hours)*
Lectures	39
Study of lecture materials	60
Data analysis labs	20
Independent study	81
Course total	**200**

STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	**Assessment Overview** Assessment in this course evaluates students' ability to apply biostatistical methods, critically interpret research findings, and address ethical considerations in biomedical and public health research. The focus is on analytical thinking, evidence-based reasoning, and the practical application of statistical and ethical principles. Students are expected to evaluate scientific studies, interpret data appropriately, and communicate research findings clearly while adhering to principles of responsible and ethical research conduct. **Assessment Methods** ● Applied statistical report and presentation (70% of final grade) ● Practice quizzes (30% of final grade) **Description of Assessment Tasks** <u>Applied statistical report and presentation</u>

	Students will prepare a scientific report analyzing a study provided in the course, including the identification of key research questions. The report must detail the statistical methodology used, present results in suitable tables and figures, and their interpretation (approx. 2000 words). Students are also required to submit a 10-minute recorded presentation summarising the project and explaining the scientific rationale for the proposed intervention. <u>Quiz</u> Students will complete mid-term quizzes. Each quiz will consist of multiple-choice questions assessing understanding, application and interpretation of key concepts covered throughout the module. **Evaluation criteria** Student performance is evaluated according to the following criteria: ● Quality and relevance of data analysis ● Critical evaluation and interpretation of results ● Clarity and structure of written work ● Quality of presentation and communication ● Accuracy of quiz responses. **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions will be provided on the course digital learning platform at the beginning of the semester.

5. RECOMMENDED BIBLIOGRAPHY

The following textbooks provide an overview of the scientific principles of the course. Additional scientific articles will be provided throughout the course.

- Daniel, W. W., & Cross, C. L. (2018). *Biostatistics: A foundation for analysis in the health sciences* (11th ed.). Wiley.
- Forthofer, R. N., Lee, E. S., & Hernandez, M. (2007). *Biostatistics: A guide to design, analysis, and discovery* (2nd ed.). Academic Press.
- Faizi, N., & Alvi, Y. (2022). *Biostatistics manual for health research: A practical guide to data analysis*. Elsevier.

HUAUOE007 - Dietary Evaluation and Growth from Embryonic Age to Adulthood

1. GENERAL

SCHOOL	School of Health Science and Education, Harokopio University		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE007	SEMESTER	1st Semester of Full-Time (FT) 1st Year of Part-Time (PT)
COURSE TITLE	Dietary Evaluation and Growth from Embryonic Age to Adulthood		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	Specialization / skills development		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

The aim of the course is to provide an evidence-based understanding of dietary evaluation and human growth from the embryonic stage through to adulthood, with emphasis on fetal programming, physiological maturation, life-course health, and the practical application of nutritional assessment tools for individuals across gestation, infancy, childhood, and the transition into adult life.

Students are expected to develop the following:

Knowledge

- Understand the physiological mechanisms of fetal growth and fetal programming on lifelong health.
- Identify nutritional requirements across the life cycle: from gestation and lactation to childhood and adolescence.
- Critically analyze methods for dietary assessment (e.g., 24h recall, food diaries) and anthropometric measurement.
- Evaluate the impact of socio-economic and environmental factors on dietary intake.

Skills & Competences

- Apply anthropometric techniques (height, weight, BMI, skinfold) to monitor growth curves and malnutrition.
- Design evidence-based nutritional plans for specific life stages (e.g., weaning, pubertal growth spurt).
- Critically appraise the impact of diet trajectories from infancy to early adulthood on overall growth, development and metabolic health.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
…….

- Search, analysis and synthesis of data and information with the use of necessary technologies
- Adaptability to new situations
- Decision-making
- Working independently
- Team work
- Working in an international environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Project planning and management
- Showing social, professional and ethical responsibility
- Criticism and self-criticism
- Production of creative and inductive thinking

3. COURSE SYLLABUS

This course introduces the scientific principles and applied practices of dietary evaluation and human growth from the embryonic stage through to adulthood. It examines nutritional requirements in relation to fetal programming, physiological maturation, energy metabolism, development, and health outcomes. Furthermore, it explores dietary assessment methodologies, anthropometric techniques, body composition, behavioral eating patterns, and medical considerations across the life course.

Key topics include:

- The architecture of growth and development: core indicators and biological, environmental and nutritional determinants
- Dietary assessment methodologies: from traditional surveys to smart tools
- Quantitative techniques for assessing physical growth and body composition
- Practical issues in assessing physical growth
- Prenatal nutrition, placental physiology, and fetal growth assessment
- Infant nutrition and critical windows of growth and development
- Childhood nutrition: Nutrient demands, evaluation of quality and adequacy and its links to growth and development
- Adolescence: Evaluating Rapid Growth, Hormonal Shifts, and Nutritional Adequacy
- Nutritional Biomarkers: Validating Dietary Data through Biological Measures
- Major disorders of growth: assessment, nutrient needs and dietary support
- Major disorders of development and mental health: assessment, nutrient needs and dietary support
- Diet and overall lifestyle in relation to metabolic health during the whole spectrum of growth
- Adult health and its association to diet and growth parameters during all stages of growth and development

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through weekly live sessions, scheduled virtual office hours, discussion forums, and email communication supported by the university learning platform.
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through group discussion during live sessions, collaborative assignments, and online discussion forums.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • Teleconference platform (Microsoft Teams) • Asynchronous learning platform (Moodle) • Collaborative digital tools • Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their work.
ORGANISATION OF TEACHING	

The mode and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.

The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.

Activity	*Semester workload (hours)*
Lectures	39
Study of lecture materials	50
Essay writing	61
Independent study	50
Course total	**200**

STUDENT ASSESSMENT

Description of the assessment method

Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Description of the assessment method

Assessment of the course is designed to evaluate students' ability to critically analyse scientific evidence, apply theoretical knowledge to practical contexts, and communicate scientific information effectively. The assessment approach emphasises critical thinking, evidence-based reasoning and applied knowledge, rather than factual recall.

Assessment methods include:

- applied scientific report and presentation (70% of final grade)
- quizzes during the semester (30% of final grade)

Description of assessment tasks

Applied scientific report and presentation

Students prepare a scientific report in journal-article format (2000 words) designing an evidence-based dietary evaluation, growth analysis, or applied nutritional support plan for an individual or population group across the life course. Students also submit a 10-minute recorded presentation summarising the key elements of the project.

Quizzes

The course incorporates formative quizzes featuring multiple-choice and open-ended components to measure conceptual understanding. Rather than focusing on factual recall, these assessments emphasize the student's ability to interpret and apply theoretical knowledge to real-world scenarios.

Evaluation criteria

Evaluation criteria include quality of literature use, critical analysis, application of knowledge, interpretation of case data, clarity of written work, and quality of presentation.

Accessibility of evaluation criteria

Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester.

5. RECOMMENDED BIBLIOGRAPHY

Indicative textbooks, consensus statements, and professional guidance relevant to sports nutrition in children and adolescents include:

Core Textbooks

1. Brown, J. E. (2019). *Nutrition throughout the life cycle* (7th ed.). Cengage Learning.
2. Cameron, N., & Bogin, B. (Eds.). (2022). *Human growth and development* (3rd ed.). Academic Press.
3. Gibson, R. S. (2005). *Principles of nutritional assessment* (2nd ed.). Oxford University Press.
4. Langley-Evans, S. C. (2009). *Nutrition: A lifespan approach*. Wiley-Blackwell.

Essential Research & Reviews
1. Barker, D. J. (1990). The fetal and infant origins of adult disease. *BMJ*, *301*(6761), 1111. doi.org
2. Godfrey, K. M., Reynolds, R. M., Prescott, S. L., Nyirenda, M., Jaddoe, V. W., Eriksson, J. G., & Broekman, B. F. (2017). Influence of maternal obesity on the long-term health of offspring. *The Lancet Diabetes & Endocrinology*, 5(1), 53-64. doi.org
3. Laitinen, K., Gissler, M., Hartikainen, A. L., & Jarvelin, M. R. (2014). Nutrition in early life and the programming of adult disease: A review. *Journal of Developmental Origins of Health and Disease*, 5(3), 173-182.

Professional Guidelines
1. EFSA (European Food Safety Authority). (2017). *Dietary reference values for nutrients: Summary report*. EFSA Supporting Publication 2017:e15121. doi.org
2. World Health Organization. (2006). *WHO child growth standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development*. World Health Organization.

Additional up to date review papers and consensus statements will be provided throughout the semester.

Term 2/Year 2 Modules

Core Modules

UOEHUA003 - Children's Mental Health and Wellbeing

1. GENERAL

SCHOOL	University of Exeter Medical School		
ACADEMIC UNIT	Department of Public Health and Sport Sciences		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	UOEHUA003	**SEMESTER**	2nd Semester of Full-Time (FT) 2nd Year of Part-Time (PT)
COURSE TITLE	Children's Mental Health and Wellbeing		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	This course provides students with an advanced understanding of the mental health and wellbeing challenges faced by children and adolescents in contemporary society. The module critically examines psychological, educational, developmental, social and public health perspectives related to child and adolescent mental health, while exploring evidence-based interventions, prevention strategies and wellbeing promotion approaches across schools, families, communities and digital environments. The module integrates theory, policy, research and practice, with emphasis on real-world applications and interdisciplinary approaches to supporting children and young people.		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		

COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

Knowledge

On successful completion of this course students will be able to:

- Critically evaluate current evidence relating to children and young people's mental health and wellbeing.
- Demonstrate understanding of developmental, psychological, educational, social and environmental determinants of mental health.
- Critically examine theoretical frameworks underpinning mental health and wellbeing in childhood and adolescence.
- Evaluate current intervention models, prevention strategies and models of care used to support children and adolescents.
- Understand the role of schools, families, communities and digital environments in influencing mental health outcomes.
- Critically evaluate research methodologies and ethical considerations relevant to child and adolescent mental health research.

Skills

Students will be able to:

- Critically analyse complex mental health challenges affecting children and adolescents.
- Apply theoretical and evidence-based approaches to the design of mental health and wellbeing interventions.
- Interpret research evidence, policy documents and intervention studies.
- Develop critical arguments relating to prevention, resilience and mental health promotion.
- Design practical and ethical mental health support approaches within educational and public health contexts.

Competences

Students will be able to:

- Apply interdisciplinary perspectives to child and adolescent mental health challenges.
- Critically evaluate school-based and community-based wellbeing interventions.
- Demonstrate professional and ethical awareness when discussing sensitive mental health topics.
- Integrate policy, research and practice perspectives into mental health promotion strategies.
- Communicate evidence-based mental health concepts effectively in academic and professional contexts.

Learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking

Working in an interdisciplinary environment *Production of new research ideas*	*……* *Other…* *……*

The course aims to promote:

- Critical thinking
- Independent learning
- Interdisciplinary collaboration
- Ethical and professional responsibility
- Problem solving
- Research literacy
- Evidence-based decision making
- Respect for diversity and inclusion
- Sensitivity to vulnerable populations
- Creative and analytical thinking
- Project planning and intervention design

3. COURSE SYLLABUS

The course introduces students to the major mental health and wellbeing issues affecting children and young people in contemporary society. Topics are adapted from the Exeter ERPM008 module structure and updated for an international and digital health-oriented MSc environment.

Indicative Weekly Topics

Lecture 1 – Introduction to Children's Mental Health and Wellbeing

- Definitions of mental health and wellbeing
- Epidemiology and global trends
- Developmental perspectives
- Public health significance

Lecture 2 – Theories of Wellbeing

- Psychological wellbeing theories
- Positive psychology
- Hedonic and eudaimonic wellbeing
- Developmental wellbeing models

Lecture 3 – Internalising and Emotional Difficulties

- Anxiety disorders
- Depression
- Emotional dysregulation
- Risk and protective factors

Lecture 4 – School Mental Health and Whole-School Approaches

- School climate and wellbeing
- Social-emotional learning
- Whole-school mental health frameworks
- Educational policy approaches

Lecture 5 – Adverse Childhood Experiences and Trauma

- ACEs and toxic stress
- Trauma-informed care
- Neurodevelopmental impacts of trauma
- Resilience frameworks

Lecture 6 – Externalising and Behavioural Difficulties

- ADHD and behavioural disorders
- Conduct problems
- Emotional regulation
- Family and social influences

Lecture 7 – Early Intervention and Prevention

- Early identification
- Prevention science

- Community and family interventions
- Multi-agency support systems

Lecture 8 – Developmental Wellbeing and Resilience

- Protective factors
- Self-esteem and coping
- Social connectedness
- Developmental resilience pathways

Lecture 9 – Positive Psychology in Childhood and Adolescence

- Strengths-based approaches
- Flourishing and wellbeing promotion
- Gratitude and mindfulness interventions
- School-based positive psychology

Lecture 10 – Technology and Mental Health

- Social media and wellbeing
- Digital risks and opportunities
- Gaming and screen time
- Digital wellbeing interventions

Lecture 11 – Self-Harm and Risk Behaviours

- Self-harm in adolescence
- Suicide prevention
- Safeguarding
- Crisis intervention pathways

Lecture 12 – Migrants, Diversity and Mental Health

- Cultural influences on mental health
- Migration and trauma
- Health inequalities
- Inclusion and equity

Lecture 13 – Mental Health in a Changing World

- Climate anxiety
- Social change and uncertainty
- Future challenges in youth mental health
- Digital and AI-supported mental health systems

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching. Teaching includes: • live online lectures • recorded lectures • interactive discussion sessions • case-based learning • workshops • guided independent study These activities are supported through the university's digital platforms for teleconferencing and asynchronous learning.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through: • weekly synchronous sessions • course discussion forums • email communication • scheduled virtual office hours • announcements on the digital learning platform
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS	Student interaction is supported through: • group discussion during live sessions • collaborative assignments

Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.	• online discussion forums • digital collaborative tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • Teleconference platform (Microsoft Teams) • Asynchronous learning platform (Moodle) • Collaborative digital tools • Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality, accuracy and academic integrity of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	

Activity	*Semester workload*
Synchronous lectures	31
Asynchronous recorded lectures	8
Study of lecture materials	60
Literature reading	30
Preparation of assignments	35
Assignment writing	20
Exam preparation	16
Course total	*200 hours*

STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Assessment of the course is designed to evaluate students' ability to critically analyse scientific evidence, apply theoretical knowledge to practical mental health contexts, and communicate scientific and professional information effectively. The assessment strategy combines formative and summative assessment methods and includes written analytical work, application-based assignments and recorded presentations. All assessments are conducted in English. The assessment approach emphasises critical thinking, evidence-based reasoning and applied understanding rather than factual recall. Assessment methods include: • analytical written report • literature review • recorded oral presentation • critical evaluation of scientific literature • problem-solving tasks • participation in online learning activities

Assessments	Weight
Critical analytical essay and recorded presentation	**70%**
Applied case study / intervention analysis task	**30%**

Description of assessment tasks
Critical analytical essay and presentation (70%)
Students prepare a critical analytical report (2000 words) examining a contemporary mental health or wellbeing issue affecting children or adolescents.

Indicative topics may include:
- school mental health
- social media and wellbeing
- trauma and resilience
- anxiety and depression
- self-harm and risk behaviours
- digital mental health
- prevention and early intervention

The report includes:
- Abstract
- Introduction
- Critical review of evidence
- Discussion of intervention approaches
- Ethical considerations
- Conclusions
- References

Students also submit a 10-minute recorded presentation summarising the key findings and explaining the scientific rationale underpinning their analysis.
Applied case study / intervention analysis task (30%)
Students complete a short applied task analysing a real-world mental health or wellbeing scenario involving children or adolescents.

The task may involve:
- interpretation of a mental health case scenario
- evaluation of school or community interventions
- analysis of psychosocial risk factors
- development of evidence-based recommendations

Submission format:
1000-word structured analysis report.

Evaluation criteria
Student performance is evaluated according to the following criteria:
- quality and relevance of scientific literature
- critical analysis and evaluation of evidence
- application of theory and evidence to practice
- interpretation of case studies or intervention scenarios
- clarity and structure of written work
- quality of presentation and communication

Accessibility of evaluation criteria

	Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester. Students receive written feedback following submission of each assessment.

5. RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

The following textbooks, guidelines and scientific resources provide an overview of the theoretical, developmental, psychological, educational and public health perspectives related to children and young people's mental health and wellbeing. Additional scientific articles and contemporary reports will be provided throughout the course.

Mental Health and Wellbeing Guidelines

World Health Organization (WHO)
Mental Health of Adolescents
https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health

World Health Organization (WHO)
Guidelines on Mental Health Promotive and Preventive Interventions for Adolescents
https://www.who.int/publications/i/item/9789240065260

NHS Digital
Mental Health of Children and Young People in England
https://digital.nhs.uk

UNICEF
The State of the World's Children: On My Mind – Promoting, Protecting and Caring for Children's Mental Health
https://www.unicef.org/reports/state-worlds-children-2021

Department for Education (UK)
Promoting Children and Young People's Mental Health and Wellbeing
https://www.gov.uk/government/publications/promoting-children-and-young-peoples-emotional-health-and-wellbeing

School Mental Health and Wellbeing Frameworks

WHO Health Promoting Schools Framework
https://www.who.int/health-topics/health-promoting-schools

Public Health England
Promoting Children and Young People's Emotional Health and Wellbeing
https://www.gov.uk/government/publications/promoting-children-and-young-peoples-emotional-health-and-wellbeing

UNESCO
Social and Emotional Learning Frameworks
https://www.unesco.org

OECD
Student Wellbeing and Mental Health Reports
https://www.oecd.org/education

Trauma, Resilience and Safeguarding

Center on the Developing Child – Harvard University
Toxic Stress and Childhood Development
https://developingchild.harvard.edu

Substance Abuse and Mental Health Services Administration (SAMHSA)
Trauma-Informed Care in Behavioural Health Services
https://www.samhsa.gov

Anna Freud National Centre for Children and Families
Schools and Mental Health Resources
https://www.annafreud.org

NSPCC

Child Protection and Safeguarding Guidance
https://www.nspcc.org.uk

Digital Mental Health and Technology

UNICEF
Children in a Digital World
https://www.unicef.org

Royal College of Psychiatrists
Social Media and Mental Health in Young People
https://www.rcpsych.ac.uk

Digital Futures Commission
Children, Technology and Wellbeing Reports
https://www.5rightsfoundation.com

Ofcom
Children and Parents Media Use Reports
https://www.ofcom.org.uk

Mental Health Assessment and Research Resources

Strengths and Difficulties Questionnaire (SDQ)
https://www.sdqinfo.org

Revised Children's Anxiety and Depression Scale (RCADS)
https://www.childfirst.ucla.edu/resources

Child Behaviour Checklist (CBCL)
https://aseba.org

Mental Health Foundation
Research and Policy Resources
https://www.mentalhealth.org.uk

Books

Taylor, E. A., Verhulst, F. C., Wong, J., Yoshida, K., & Nikapota, A. (2020). Mental Health and Illness of Children and Adolescents. Springer.
Laver-Bradbury, C., Thompson, M. J., Gale, C., & Hooper, C. M. (2021). Child and Adolescent Mental Health: Theory and Practice. CRC Press.
Dogra, N., Parkin, A., Warner-Gale, F., & Frake, C. (2018). A Multidisciplinary Handbook of Child and Adolescent Mental Health for Front-Line Professionals. Jessica Kingsley Publishers.
Burton, M., Pavord, E., & Williams, B. (2014). An Introduction to Child and Adolescent Mental Health. Sage.
Carr, A. (2006). What Works with Children, Adolescents and Adults? A Review of Research on the Effectiveness of Psychotherapy. Routledge.
Garvis, S., & Pendergast, D. (2017). Health and Wellbeing in Childhood. Cambridge University Press.
Owens, R. L., & Waters, L. (2020). Positive Psychology Interventions for Children and Adolescents. Journal of Positive Psychology.
Weare, K. (2015). What Works in Promoting Social and Emotional Well-being and Responding to Mental Health Problems in Schools? National Children's Bureau.

Key Peer-Reviewed Journals

- Journal of Child Psychology and Psychiatry
- Child and Adolescent Mental Health
- Journal of Adolescent Health
- School Mental Health
- The Lancet Psychiatry
- Clinical Child Psychology and Psychiatry
- Journal of Youth and Adolescence
- International Journal of Mental Health Promotion
- Children and Youth Services Review

Students should consult:

- PubMed – https://pubmed.ncbi.nlm.nih.gov
- PsycINFO – https://www.apa.org/pubs/databases/psycinfo
- Web of Science – https://www.webofscience.com
- Scopus – https://www.scopus.com
- Google Scholar – https://scholar.google.com

Students should consult:

- PubMed – https://pubmed.ncbi.nlm.nih.gov
- SPORTDiscus – https://www.ebsco.com
- Web of Science – https://www.webofscience.com
- Scopus – https://www.scopus.com

HUAUOE008 - Introduction to Machine Learning & AI for Health

1. GENERAL

SCHOOL	Digital Technology, Harokopio University		
ACADEMIC UNIT	Department of Informatics and Telematics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE008	**SEMESTER**	2nd Semester of Full-Time 2nd Year of Part-Time
COURSE TITLE	Introduction to Machine Learning and Artificial Intelligence (AI) for Health		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		2	
Lab		1	
Total		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	• General background • Skills development		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	• In-person (%): 0% • Synchronous distance learning (%): 80% • Asynchronous distance learning (%): 20% Synchronous teaching is delivered through the approved teleconference platform, while asynchronous learning is delivered through the university learning management system (Moodle).		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*

- *Brief Guide for drafting Learning Outcomes*

The course introduces students to the principles, methods and responsible use of Machine Learning (ML) and Artificial Intelligence (AI) in health. It develops both conceptual understanding and practical skills for working with health data, building and evaluating simple ML pipelines, and critically assessing modern AI systems and outputs for clinical and public health applications.

Students are expected to develop the following:

Knowledge
• Explain core concepts in ML and AI and their relevance to general healthcare and day-to-day professional workflows.
• Describe and interpret common health data types, health information systems, and key interoperability standards, including EHR-derived data, clinical coding systems and structured data relevant to clinical and wellbeing contexts.
• Analyse the principles of regression, classification, neural networks, representation learning, transformers and large language models in healthcare contexts.
• Evaluate the opportunities, limitations and risks of AI in health, including bias, interpretability, safety and deployment challenges.

Skills
• Work with structured and unstructured health data and prepare data for analysis and modelling.
• Build, test and evaluate basic end-to-end ML pipelines and interpret their outputs using accessible digital tools.
• Interpret model performance using suitable evaluation metrics and identify common issues such as overfitting, bias, data leakage and poor generalisation.
• Critically appraise healthcare and nutrition-related AI applications, including decision-support, risk prediction, behaviour monitoring, virtual coaching and LLM-based systems.

Competences
• Integrate technical, clinical and ethical perspectives when assessing AI systems for healthcare and wellbeing.
• Make informed decisions about when and how ML/AI methods can be appropriately applied to health, nutrition and child wellbeing problems.
• Engage responsibly with emerging AI tools in professional, academic and multidisciplinary healthcare settings.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
……

Search, analysis and synthesis of data and information with the use of necessary technologies
Adaptability to new situations
Decision-making
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

Showing social, professional and ethical responsibility Criticism and self-criticism Production of creative and inductive thinking

3. COURSE SYLLABUS

This course introduces students to Artificial Intelligence (AI) and Machine Learning (ML) with a specific emphasis on healthcare, prevention, nutrition and wellbeing applications.. The course progressively builds technical understanding and practical skills through three integrated strands: health data and AI foundations, machine learning for healthcare, and large language models and agentic AI.

Key topics include

- Introduction to AI and ML in health: definitions; definitions; clinically relevant use cases; how AI fits into health, nutrition and wellbeing services; structure of information systems and AI/ML pipelines
- Health data foundations: health data types; data representation; electronic health records; generated clinical and lifestyle data
- Interoperability and standards: ICD-10 / ICD-11; SNOMED CT; FHIR; DICOM; European Health Data Space (EHDS)
- Deriving value from health data: observational data; statistical analysis; machine learning applications; research versus real-world evidence
- Introduction to machine learning: types of ML problems; learning objectives; linear regression; core workflow concepts
- End-to-end ML pipelines: data preprocessing; regression and classification models; model evaluation; implementation in KNIME
- Beyond linear models: decision trees; ensemble methods; neural networks; overfitting; Generalisation
- Image and signal analysis: introductory signal processing; image processing fundamentals; convolutional neural networks; basic image classification
- Behaviour and lifestyle measurement with ML: analysis of 1D signals, images and video; applications in physical activity, diet, adherence and wellbeing
- Challenges in healthcare ML: interpretability; sources of bias; mitigation strategies; foundation model opportunities and risks
- Large language models: representation learning; word embeddings; transformers; generative modelling; next-token prediction
- Task-specific AI systems: pretraining versus fine-tuning; alignment approaches; retrieval-augmented generation (RAG)
- Agentic systems and workflows: agent architectures; orchestration and automation; practical workflow tool
- AI applications in healthcare and nutrition: current real-world applications; decision support; patient communication; virtual coaching; opportunities, risks and open challenges.

Throughout the course, students engage in hands-on exercises and project-based activities using health- and wellbeing-related datasets and digital tools.

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching, with live online lectures, demonstrations and practical laboratory sessions.

MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through weekly live sessions, scheduled virtual office hours, announcements on the digital learning platform and email communication. Announcements, learning materials, guided exercises and project briefs are uploaded regularly to support continuous engagement throughout the course.
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through: • group discussion during live sessions • practical activities and project work • peer exchange during demonstrations and Q&A sessions • shared digital tools for collaborative exploration of workflows and outputs
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • KNIME analytics platform • OpenEMR platform • Teleconference platform (Microsoft Teams) • Asynchronous learning platform (Moodle) • Collaborative digital tools • Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	

Activity	***Semester workload (hours)***
Lectures	39
Study of lecture materials	55
Projects (exercises and reports) completion	56
Independent study	50
Course total	**200**

STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report,*	**Description of the assessment method** Assessment of the course is designed to evaluate students' ability to understand core AI/ML concepts, apply them to health data problems, critically assess healthcare AI systems, and communicate findings clearly. The assessment approach emphasises applied knowledge,

oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	critical reasoning and responsible use of AI rather than factual recall alone. **Assessment methods include:** ● project-based coursework and written presentation (70% of final grade) ● final oral examination (30% of final grade) **Description of assessment tasks** <u>Project-based coursework and presentation</u> Students complete 3 separate applied projects in which they develop, document and evaluate a healthcare-focused ML/AI workflow using course tools and concepts. The written submission presents the problem, data, methods and evaluation results, along with the interpretation of findings. <u>Final oral examination</u> At the end of the course, students complete a final oral examination assessing understanding of key concepts covered throughout the module. The knowledge required to answer the examination questions will be acquired either during lectures or via project completion. The examination may include conceptual questions, short applied interpretation tasks and discussion of methodological choices related to the course. **Evaluation criteria** ● correct use of data, methods and workflow design ● critical interpretation of model performance and limitations ● understanding of bias, interpretability, safety and responsible AI issues ● clarity, structure and scientific quality of delivered projects and reports ● accuracy and completeness of oral examination responses **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester.

5. RECOMMENDED BIBLIOGRAPHY

The following textbooks and guidelines provide an overview of the scientific principles and applied practices related to exercise, physical activity and health in children and adolescents. Additional scientific articles will be provided throughout the course.

Suggested bibliography:

- Rajkomar, A., Dean, J., & Kohane, I. (2019). Machine Learning in Medicine. New England Journal of Medicine, 380, 1347-1358.
- Bishop, C. M., & Bishop, H. (2024). Deep Learning: Foundations and Concepts. Springer.
- Chen, S., Guevara, M., Moningi, S., Hoebers, F., Elhalawani, H., Kann, B. H., ... & Bitterman, D. S.

(2024). The effect of using a large language model to respond to patient messages. *The Lancet Digital Health*, *6*(6), e379-e381.
- Beam, A. L., & Kohane, I. S. (2018). Big data and machine learning in health care. *Jama*, *319*(13), 1317-1318.
- Matheny, M. E., Israni, S. T., Ahmed, M., & Whicher, D. (Eds.). (2020). Artificial Intelligence in Health Care: The Hope, the Hype, the Promise, the Peril. National Academy of Medicine.
- World Health Organization. (2024). Ethics and governance of artificial intelligence for health: large multi-modal models. WHO guidance. World Health Organization.

Related academic journals:
The Lancet Digital Health
npj Digital Medicine
JAMIA (Journal of the American Medical Informatics Association)
Artificial Intelligence in Medicine
Nature Medicine
Journal of Biomedical Informatics

Optional Modules – Term 2 Pool (students select 2 from 4)

UOEHUA004 -Behavioural Science to Promote Better Childhood Nutrition and Physical Activity

1. GENERAL

SCHOOL	University of Exeter Medical School		
ACADEMIC UNIT	Department of Public Health and Sport Sciences		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	UOEHUA004	**SEMESTER**	2nd Semester of Full-Time (FT) 2nd Year of Part-Time (PT)
COURSE TITLE	Behavioural Science to promote better childhood nutrition and physical activity		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	The course provides students with an overview of key behavioural sciences theories and methods including COM-B and the behaviour change wheel, social cognitive models and nudge theory to understand, design and deliver effective change programs and randomised trials to promote better childhood nutrition and physical activity.		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%):20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

Knowledge

- Demonstrate understanding of key behavioural science theories used to predict and explain childhood health behaviours
- Demonstrate understanding of the role of social, demographic, environmental, and commercial determinants influencing childhood nutrition and physical activity
- Demonstrate understanding of the principles and methodologies underpinning randomized controlled trials and real-world (field) evaluations of behaviour change interventions
- Critically understand ethical theories, debates, and considerations related to behaviour change interventions targeting children

Skills

- Design theory-informed behaviour change interventions to improve childhood nutrition and physical activity
- Design appropriate evaluation strategies, including trials, to assess intervention effectiveness
- Apply appropriate methods to measure health behaviours and critically appraise intervention design, implementation, and outcomes

Competences

- Develop and implement behaviour change interventions targeting childhood nutrition and physical activity in real-world contexts
- Apply evaluation frameworks to assess the effectiveness and impact of behaviour change interventions in practice
- Critically appraise public health policies and real-world interventions aimed at improving childhood nutrition and physical activity

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
… …
Other…
… … .

Adaptability to new situations
Decision-making
Working independently
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Production of free, creative and inductive thinking

Additional Skills

- Application of behavioural science theories, models and methods to real-world public health challenges
- Understanding and application of systems thinking and social-ecological approaches
- Ability to design, implement and evaluate behaviour change interventions
- Understanding of social determinants of health and health inequalities
- Ethical evaluation of behavioural interventions and public health policies
- Understanding the structure and methodology of randomized and real world trials
- Ability to apply futures thinking and horizon scanning in public health contexts

3. COURSE SYLLABUS

This course introduces students to key behavioural science theories, methods and practices to understand and promote healthier dietary choices and greater physical activity in children.

Key topics include

Lecture 1: Introduction to Behavioural Science of Childhood Nutrition and Physical Activity

- Importance of behavioural science for nutrition and PA promotion in children
- Measuring childhood health behaviours
- Overview of nutrition and PA promotion challenges for children

Lecture 2: Foundational Behavioural Theories and Models

- Overview of foundational social cognitive behavioural science models
- Introduction to COM-B and the behaviour change wheel
- Introduction to nudge theory

Lecture 3: Habits and the Food Environment

- Review major mechanisms of habit formation for nutrition and PA
- Introduction to behaviourism and choice architecture interventions to 'nudge' healthier choices

Lecture 4: Food Marketing, Branding and Advertising

- Introduction to the influence of marketing, branding and advertising on childhood food choice and PA
- intervention approaches to tackle the role of marketing, branding and advertising on children's health

Lecture 5: Social-Ecological Models

- Introduction to multi-level 'ecological models' and systems thinking for childhood obesity
- Introduction to multi-component interventions and real-world complex trials
- Overview of MRC guidance on complex interventions

Lecture 6: Social determinants of health

- Overview of socio-demographic drivers of childhood nutrition and PA
- Overview of social inequalities and childhood health behaviours

Lecture 7. Public Health Interventions for Childhood Nutrition and Physical Activity

- Overview of major policies and case studies to improve children's nutrition and PA from Greece, the European Union, and internationally
- Introduction to high risk vs. population approaches to health behaviour change

Lecture 8. Ethics of Influence

- Overview of major debates concerning behavioural health policies targeting childhood nutrition and PA
- Ethical frameworks governing public health interventions and research trials

Lecture 9: Social Influences on Childhood Nutrition and Physical Activity

- Overview of family-related determinants and interventions for childhood nutrition and PA
- peer-group influences, social mimicry, social norms, role modelling and social support

Lecture 10: School-based interventions for Childhood Nutrition and Physical Activity

- Best-practices for school-based health promotion interventions with case studies
- Impact of better childhood nutrition and PA on academic outcomes and wellbeing

Lecture 11: Personalized digital health for Children

- Overview of digital health tools and gamification for promoting better childhood nutrition and PA
- Challenges and promise of digital media and health promotion for children
- Tools to measure diet and activity in digital environments, including ecological momentary assessment

Lecture 12: Longitudinal Habit Formation and Behavioural Transitions into Adolescences and adulthood

- Habit formation in early years and life transitions for sustained behaviour change
- Prevention vs. treatment – reviewing longitudinal research findings into adulthood
- Self-regulation skills and lifelong health

Lecture 13: The Future of Behaviour Change for Childhood Nutrition and Physical Activity

- Projected trends in childhood nutrition, PA and health outcomes to 2050
- Introduction to horizon scanning and futures thinking activities for nutrition and PA

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching. Teaching includes: • live online lectures • recorded lectures • interactive discussion sessions • case-based learning • independent study These activities are supported through the university's digital platforms for teleconferencing and asynchronous learning.

MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through: • weekly synchronous sessions • course discussion forums • email communication • scheduled virtual office hours • announcements on the digital learning platform
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through: • group discussion during live sessions • collaborative assignments • online discussion forums • digital collaborative tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: Teleconference platform (Microsoft Teams) Asynchronous learning platform (Moodle) Collaborative digital tools Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	

Activity	*Semester workload*
Synchronous lectures	13
Asynchronous recorded lectures	26
Study of lecture materials	60
Literature reading	30
Case study assignment & presentation	28
Study protocol assignment	43
Course total	*200 hours*

STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation,*	**Description of the assessment method** Assessment of the course is designed to evaluate students' ability to critically analyse behavioural science evidence, apply theoretical knowledge to practical contexts, and understand complex causation.

laboratory assignment, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

The assessment strategy combines formative and summative assessment methods and includes written analytical work, application-based assignments and recorded presentations. All assessments are conducted in English.
The assessment approach emphasises critical thinking, evidence-based reasoning and applied knowledge, rather than factual recall.

Assessment methods include:

- analytical written report
- recorded oral presentation
- critical evaluation of scientific literature
- problem-solving tasks
- participation in online learning activities

Assessments	Weight
Analytical written report – evaluation protocol	60%
Case study and problem-solving task and recorded oral presentation	40%

Description of assessment tasks

Case study and problem-solving task and recorded oral presentation (50%)
Students complete a short, applied task analysing a real-world scenario related to behaviour change for childhood nutrition and health

The task may involve:

- reviewing an existing challenge or case study
- conducting a diagnosis of behavioural determinants
- developing a theory-based intervention
- recording a 'pitch' presentation for the project

Submission format:
10-12 slide evaluation 'pitch' deck with references
10 min recorded presentation 'pitch' for the project

Analytical written report - study protocol (50%)
Students chose a specific childhood nutrition or physical activity challenge, a context and develop a concept for an evidence-based behaviour change intervention.

Students develop an evaluation protocol for a field trial, including details of behaviour measures, study design and ethical considerations.

Submission:
1500-word evaluation protocol including key sections:
Background & rationale
Theoretical grounding
Intervention design
Behavioural measurement
Study design

	Ethical considerations Strengths and limitations **Evaluation criteria** Student performance is evaluated according to the following criteria: ● quality and relevance of scientific literature ● critical analysis and evaluation of evidence ● application of knowledge and behavioural theory to intervention design ● interpretation of data or case study ● clarity and structure of written work ● quality of presentation and communication. **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester. Students receive written feedback following submission of each assessment.

5. RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

The following textbooks and guidelines provide an overview of the major theories, methods and practices associated with behavioural science for health behaviour change. Additional scientific articles will be provided throughout the course.

Behaviour change theories

- *Nudge: Improving Decisions About Health, Wealth, and Happiness – Richard Thaler & Cass Sunstein.* https://yalebooks.yale.edu/book/9780300262285/nudge/
- *Thinking Fast and Slow - Daniel Kahneman.* https://www.penguin.co.uk/books/56314/thinking-fast-and-slow-by-kahneman-daniel/9780141033570
- *The Behaviour Change Wheel: A Guide to Designing Interventions – Susan Michie et al.* https://www.behaviourchangewheel.com/
- *The Handbook of Behavior Change - Martin S. Hagger, Linda D. Cameron, Kyra Hamilton, Nelli Hankonen, Taru Lintunen.* https://www.cambridge.org/core/books/handbook-of-behavior-change/BD76D0E53DB1BC2EE8C53C1603D45E6A
- *Predicting and Changing Health Behaviour: Research and Practice with Social Cognition Models – Marc Conner & Paul Norman.* https://backstory.london/products/9780335263783?utm
- *Behavioural Science in Public Health – Benedict Howell.* https://www.primedpublishing.com/View.aspx?id=1892&utm

Behaviour change frameworks

- *The Behavior Change Technique Taxonomy (v1) - https://digitalwellbeing.org/wp-content/uploads/2016/11/BCTTv1_PDF_version.pdf*
- *The behaviour change wheel: A new method for characterising and designing behaviour change interventions - Susan Michie, Maartje M van Stralen, Robert West. https://pmc.ncbi.nlm.nih.gov/articles/PMC3096582/*
- *The COM-B model of behaviour - The COM-B Website*
- *Intervention Mapping: Theory- and Evidence-Based Health Promotion Program Planning: Perspective and Examples - Maria Fernandez, Robert A C Ruiter, Christine M Markham, Gerjo Kok. https://pmc.ncbi.nlm.nih.gov/articles/PMC6702459/*

Public Health intervention guidelines

- *National Institute for Health and Care Excellence – Behaviour change and public health guidelines - https://www.nice.org.uk/guidance/ph49*
- *A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance - Skivington K, Matthews L, Simpson S A, Craig P, Baird J, Blazeby J M et al. https://www.bmj.com/content/374/bmj.n2061*
- *RE-AIM framework - RE-AIM – Home – Reach Effectiveness Adoption Implementation Maintenance*

Behavioural measurement

- *Measuring physical activity in children and adolescents for dietary surveys: practicalities, problems and pitfalls. Jennifer S. Mindell,Ngaire Coombs,Emmanuel Stamatakis. PNS1300382 218..225*
- *A comparison of direct versus self-report measures for assessing physical activity in adults: a systematic review. Stéphanie A Prince, Kristi B Adamo, Meghan E Hamel, Jill Hardt, Sarah Connor Gorber & Mark Tremblay - https://link.springer.com/article/10.1186/1479-5868-5-56*
-
- *Closing the Gap Between Physical Activity Intentions and Sustained Behavior: An Overview of Evidence. Ryan E. Rhodes and Carol Brennan - https://journals.lww.com/acsm-esm/fulltext/2026/01000/closing_the_gap_between_physical_activity.4.aspx*
- *Overview of systematic reviews on behavioral determinants of physical activity and healthy eating in schoolchildren. Giuliano Duarte Anselmi, Adriana Aparecida de Oliveira Barbosa, Gerson Ferrari, Anna Christina Pinheiro Fernandes, Jacqueline Araneda-Flores, Danáe Arancibia González & Tito Pizarro-Quevedo - https://www.nature.com/articles/s41598-025-19332-9*

RCT & field designs & analysis

- *How to Conduct a Randomized Controlled Trial, Ramandeep Kaur, Jie Li - https://pmc.ncbi.nlm.nih.gov/articles/PMC10753608/*
- *CONSORT2025 Statement: updated guideline for reporting randomised trials - https://www.equator-network.org/reporting-guidelines/consort/*
- *Developing and evaluating complex interventions: the new Medical Research Council guidance. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M et al. - https://www.bmj.com/content/bmj/337/bmj.a1655.full.pdf*
- *Assessing causality in epidemiology: revisiting Bradford Hill to incorporate developments in causal thinking. Michal Shimonovich · Anna Pearce, Hilary Thomson, Katherine Keyes,*

Srinivasa Vittal Katikireddi - https://link.springer.com/content/pdf/10.1007/s10654-020-00703-7.pdf

- *Field Trials of Health Interventions: A Toolbox. Smith PG, Morrow RH, Ross DA. https://www.ncbi.nlm.nih.gov/books/NBK305515/pdf/Bookshelf_NBK305515.pdf*

Key peer-reviewed academic references

- *Aychiluhm et al. (2025) — Interventions for Childhood Central Obesity: A Systematic Review and Meta-Analysis of RCTs. https://doi.org/10.1001/jamanetworkopen.2025.4331*
- *Jacob et al. (2021) — A Systematic Review and Meta-Analysis of School-Based Obesity Prevention Interventions*
- *Int J Behav Nutr Phys Act - https://link.springer.com/article/10.1186/s12966-020-01065-9*
- *PLOS One Review (2015) — Effectiveness of Interventions on Sustained Childhood Physical Activity - https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0132935*
- *Nally et al. (2021) — Nutrition Interventions on Children's Nutritional Knowledge and Healthy Eating. Systematic Review of Dietary Interventions in Childhood (2019)- https://pmc.ncbi.nlm.nih.gov/articles/PMC8107859/*
- *School-based Accelerometer-Assessed PA Interventions (2022) — meta-analysis of accelerometer-measured PA and sedentary time in children - https://doi.org/10.1016/j.puhe.2022.10.004*

Key peer-reviewed journals

- *Health Psychology*
- *Social Science & Medicine*
- *The Lancet Public Health*
- *Obesity Reviews*
- *Appetite*
- *International Journal of Behavioral Nutrition and Physical Activity*

HUAUOE009 - Prevention and Management of Childhood Obesity

1. GENERAL

SCHOOL	School of Health Science & Education, Harokopio University		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE009	**SEMESTER**	2nd Semester of Full-Time (FT) 2nd Year of Part-Time (PT)
COURSE TITLE	Prevention & Management of Childhood Obesity and Comorbidities		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and interactive seminars		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5 ECTS
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	Special background / Specialisation		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%) synchronous distance learning (%) asynchronous distance learning (%) (In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	• n-person (%): 0% • synchronous distance learning (%): 80% • asynchronous distance learning (%): 20%		
AVAILABILITY TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

- **LEARNING OUTCOMES**

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

1. *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
2. *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
3. *Brief Guide for drafting Learning Outcomes*

The aim of the course is to provide students with an in-depth, evidence-based understanding of the prevention and management of childhood and adolescent obesity and its associated comorbidities. The module integrates clinical nutrition, paediatrics, epidemiology, public health, behavioural sciences, and policy perspectives, with emphasis on translating evidence into effective and sustainable interventions and policies.

On successful completion of the course, students will be able to:

Knowledge

- Explain the epidemiology, biological, behavioural, psychosocial, and environmental determinants of childhood and adolescent obesity.
- Describe the major metabolic, cardiovascular, psychological, and endocrine comorbidities associated with obesity across the life course.
- Evaluate the role of early-life factors, family environment, dietary behaviours, physical activity, sleep, and socioeconomic determinants in obesity development.
- Critically appraise current evidence regarding prevention and treatment approaches for childhood obesity.

Skills

- Assess and interpret anthropometric, dietary, behavioural, and clinical data related to obesity risk and management in children and adolescents.
- Apply evidence-based strategies for obesity prevention and management in clinical, school, community, and policy settings.
- Critically evaluate national and international obesity prevention programmes, digital health interventions, and policy initiatives.
- Design multidisciplinary and population-based intervention strategies targeting obesity and related comorbidities.

Competences

- Integrate clinical, nutritional, behavioural, and public health perspectives into obesity prevention and management strategies.
- Communicate scientific evidence effectively to multidisciplinary audiences.
- Develop ethical, equitable, and sustainable approaches for obesity prevention and health promotion.
- Apply principles of implementation science and programme evaluation in obesity-related interventions.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
… …
Other…
… …

The course aims to develop the following competences:

- Search, analysis and synthesis of data and information using relevant technologies
- Adaptability to new situations
- Decision-making
- Working independently
- Teamwork
- Working in an interdisciplinary environment
- Production of new research ideas
- Project planning and management

- Showing social, professional and ethical responsibility
- Respect for diversity and multiculturalism
- Criticism and self-criticism
- Production of free, creative and inductive thinking

- **COURSE SYLLABUS**

This course provides an advanced overview of the determinants, prevention, and management of childhood and adolescent obesity and related comorbidities. The course adopts a multidisciplinary and life-course perspective, integrating nutrition science, clinical practice, behavioural sciences, public health, and policy approaches.

Key topics include:

- Epidemiology and global burden of childhood obesity
- Biological and genetic determinants of obesity
- Early-life determinants and the first 1,000 days
- Dietary patterns, ultra-processed foods, and food environments
- Physical activity, sedentary behaviour, and sleep
- Cardiometabolic and endocrine comorbidities
- Psychological and mental health dimensions
- Anthropometric and clinical assessment methods
- Community-based and national obesity prevention programmes
- Multidisciplinary obesity management approaches
- Policy, regulation, and population-level interventions
- Digital health interventions and precision nutrition
- Monitoring, implementation science, and translation into practice

The course includes case studies, critical appraisal of scientific literature, and applied examples from international obesity prevention initiatives.

- **TEACHING AND LEARNING METHODS - ASSESSMENT**

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance and blended learning using synchronous and asynchronous teaching methods.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is supported through weekly live sessions, virtual office hours, announcements, email communication, and discussion forums via the university digital learning platform.
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is facilitated through group discussions, collaborative assignments, breakout-room activities, online discussion forums, and interactive case-study sessions.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	The course uses teleconference platforms, Moodle , online collaborative tools, multimedia educational material, and online assessment systems.
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students require a computer/tablet, stable internet connection, webcam, microphone, and access to the university digital learning environment.
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are subject to plagiarism screening using Turnitin or equivalent software according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor*	The use of Artificial Intelligence tools is permitted only when clearly acknowledged and appropriately referenced. Students remain responsible for the originality, integrity, and scientific accuracy of submitted work.

(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature
(4) Students are free to use Artificial Intelligence

ORGANISATION OF TEACHING

The mode and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.

The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.

Activity	*Semester workload*
Lectures and seminars	39
Study of lecture material	50
Critical literature review/ assignment preparation	55
Independent study	56
Course total	***200***

STUDENT ASSESSMENT

Description of the assessment method

Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Assessment Methods
Assessment is designed to evaluate students' ability to critically analyse scientific evidence, apply knowledge to practical and policy contexts, and integrate multidisciplinary approaches to obesity prevention and management.

Assessment Components
Scientific Assignment and Presentation (70%)
Students prepare an evidence-based scientific report (approximately 2,500 words) focusing on a contemporary issue related to childhood obesity prevention or management. The assignment may include critical appraisal of interventions, policy analysis, programme evaluation, or development of an obesity prevention strategy.
Students also deliver a short oral or recorded presentation summarising the rationale, methodology, and implications of their work.

Final Quiz / Examination (30%)
Students complete a final assessment consisting of multiple-choice questions, short-answer responses, and case-based problem-solving questions evaluating understanding and application of course concepts.

Evaluation Criteria
Assessment is based on:
- quality and relevance of scientific evidence
- critical thinking and interpretation of literature
- application of theory into practice
- scientific writing and structure
- clarity of oral communication
- problem-solving ability
- integration of multidisciplinary perspectives

Detailed marking rubrics and assessment guidelines are provided through the course digital platform at the beginning of the semester.

- **RECOMMENDED BIBLIOGRAPHY**

Core Textbooks and Reference Books

- Styne, D. M., Arslanian, S. A., Connor, E. L., Farooqi, I. S., Murad, M. H., Silverstein, J. H., & Yanovski, J. A. (2017). *Pediatric Obesity—Assessment, Treatment, and Prevention: An Endocrine Society Clinical Practice Guideline*. Journal of Clinical Endocrinology & Metabolism, 102(3), 709–757.
- Lobstein, T., Jackson-Leach, R., Moodie, M., Hall, K., Gortmaker, S., Swinburn, B., James, W. P. T., Wang, Y., & McPherson, K. (2015). *Child and Adolescent Obesity: Causes and Consequences*. Oxford University Press.
- World Health Organization (WHO). (2016). *Report of the Commission on Ending Childhood Obesity*. Geneva: WHO.
- World Health Organization (WHO). (2020). *Guidelines on Physical Activity and Sedentary Behaviour*. Geneva: WHO.
- Baur, L. A., & Twigg, S. M. (Eds.). (2019). *Clinical Obesity in Adults and Children* (4th ed.). Wiley-Blackwell.
- Birch, L. L., & Ventura, A. K. (2009). Preventing childhood obesity: what works? *International Journal of Obesity*, 33(S1), S74–S81.
- Brownell, K. D., & Walsh, B. T. (Eds.). (2017). *Eating Disorders and Obesity: A Comprehensive Handbook* (3rd ed.). Guilford Press.

International Guidelines and Policy Documents

- World Health Organization (WHO). (2022). *WHO European Regional Obesity Report 2022*.
- UNICEF, WHO & World Bank Group. (2023). *Levels and Trends in Child Malnutrition*.
- European Association for the Study of Obesity (EASO). *Childhood Obesity Task Force Resources*. https://easo.org
- American Academy of Pediatrics (AAP). (2023). *Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity*. *Pediatrics*, 151(2).
- U.S. Department of Health and Human Services. (2018). *Physical Activity Guidelines for Americans* (2nd ed.).
- OECD. (2019). *The Heavy Burden of Obesity: The Economics of Prevention*. OECD Publishing.
- UNICEF. (2019). *The State of the World's Children: Children, Food and Nutrition*.

Key Scientific Journals

Students are encouraged to regularly access and critically review publications from the following journals:

- *Obesity Reviews*
- *Pediatric Obesity*
- *International Journal of Obesity*
- *Public Health Nutrition*
- *Nutrients*
- *The Lancet Child & Adolescent Health*
- *The Lancet Digital Health*
- *Childhood Obesity*
- *American Journal of Clinical Nutrition*
- *European Journal of Clinical Nutrition*
- *Nutrition Reviews*
- *Journal of Adolescent Health*

Additional Digital Resources and Organisations

- World Health Organization (WHO): https://www.who.int
- UNICEF Nutrition Resources: https://www.unicef.org/nutrition
- European Association for the Study of Obesity (EASO): https://easo.org
- OECD Health Statistics and Obesity Reports: https://www.oecd.org/health
- Centers for Disease Control and Prevention (CDC) Childhood Obesity Resources: https://www.cdc.gov/obesity
- European Childhood Obesity Group (ECOG): https://www.ecog-obesity.eu

HUAUOE010 - Employability and Entrepreneurship in Healthcare Professions

1. GENERAL

SCHOOL	School of Health Sciences and Education, Harokopio University		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE010	**SEMESTER**	2nd Semester of Full-Time (FT) 2nd Year of Part-Time (PT)
COURSE TITLE	Employability and Entrepreneurship in Healthcare Professions		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures, workshops and applied career scenarios		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	The course provides specialised knowledge and applied professional skills related to employability, entrepreneurship, innovation, leadership and career sustainability within healthcare, medicine, wellbeing, public health and digital health sectors.		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% The course is delivered through a blended online learning model combining synchronous interactive teaching activities with structured asynchronous learning activities. Synchronous teaching includes: • live lectures • workshops • tutorials • discussion sessions • presentations • career simulation activities Asynchronous learning includes: • recorded educational material • guided study activities • reading assignments • discussion forums • independent learning activities		

	Synchronous teaching is delivered through approved teleconference platforms, while asynchronous learning is delivered through the university learning management system.
AVAILABILITY TO ERASMUS STUDENTS	Yes.
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

Knowledge

- Describe international labour markets and employment pathways within healthcare, wellbeing and digital health sectors.
- Explain employability principles relevant to healthcare professionals and graduates.
- Analyse entrepreneurial models and business structures within healthcare and wellbeing services.
- Evaluate professional, legal and ethical considerations associated with healthcare entrepreneurship and practice.
- Describe the role of digital health technologies and artificial intelligence within healthcare professions.

Skills

- Develop professional CVs, digital portfolios and interview strategies relevant to healthcare careers.
- Design realistic healthcare business and service delivery models.
- Apply strategic thinking to career planning and professional development.
- Interpret professional opportunities across public, private, corporate and research sectors.
- Communicate professional and entrepreneurial concepts effectively to multidisciplinary audiences.

Competences

- Integrate employability and entrepreneurial principles into professional healthcare practice.
- Demonstrate independent and critical thinking regarding career sustainability and innovation.
- Collaborate effectively within interdisciplinary professional environments.
- Evaluate healthcare innovation opportunities using evidence-based and ethically responsible approaches.

Learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
… …

Production of new research ideas	*Other…* ……

The course aims to develop the following competences:

- Search, analysis and synthesis of data and information with the use of necessary technologies
- Adaptability to new situations
- Decision-making
- Working independently
- Teamwork
- Working in an international environment
- Working in interdisciplinary environments
- Production of new research and innovation ideas
- Project planning and management
- Respect for diversity and multiculturalism
- Respect for ethical and professional responsibilities
- Reflection and self-reflexion
- Production of creative and inductive thinking
- Professional communication and leadership skills
- Entrepreneurial and strategic thinking

3. COURSE SYLLABUS

This course introduces students to employability, entrepreneurship and innovation pathways within healthcare, medicine, wellbeing and digital health sectors. The module bridges academic training with real-world professional development and prepares graduates for diverse clinical, academic, corporate and entrepreneurial careers across Greece, Europe and internationally.
The course focuses on practical career readiness, healthcare innovation, strategic professional development and sustainable career planning.

Weekly Topics

Week 1 — Health, Medicine & Wellbeing International Job Markets

- International healthcare labour markets
- Public and private healthcare systems
- Clinical and non-clinical career pathways
- Emerging professions in health and wellbeing
- International employability trends

Week 2 — Employability Skills in Healthcare: Developing a Strong CV

- Professional CV development
- Cover letters and personal statements
- Interview preparation
- Translating qualifications into employability skills
- Digital recruitment systems

Week 3 — Strategic Entrepreneurship for Health Professionals: Models, Markets and Validation

- Entrepreneurship principles in healthcare
- Market analysis and validation
- Healthcare innovation ecosystems
- Startup development strategies
- Service feasibility and scalability

Week 4 — Corporate Wellbeing for Healthcare Professionals

- Occupational health and corporate wellbeing
- Workplace health promotion
- Corporate wellness programme development
- Employer and insurer partnerships
- Careers in corporate wellbeing

Week 5 — Professional Branding for Healthcare Students and Graduates

- Professional identity development
- LinkedIn optimisation
- Digital visibility and networking

- Scientific and professional communication
- Professional online reputation

Week 6 — Private Clinics in Health and Wellbeing

- Private clinic structures
- Financial and operational management
- Referral systems and patient acquisition
- Multidisciplinary healthcare services
- Sustainability and risk management

Week 7 — Business Models in Health, Medicine & Wellbeing

- Healthcare business models
- B2B and B2C services
- Subscription and hybrid models
- Insurance-linked healthcare
- Revenue streams and pricing

Week 8 — Interdisciplinary Coaching Pathways

- Coaching in healthcare and wellbeing
- Behaviour change principles
- Interdisciplinary communication
- Lifestyle medicine and coaching
- Ethical and professional boundaries

Week 9 — Digital Health Tools for Healthcare Professionals

- Digital health ecosystems
- Telehealth and remote monitoring
- Wearables and healthcare technologies
- Healthcare platforms and digital services
- Data interpretation and communication

Week 10 — Artificial Intelligence in Child & Family Health

- AI applications in healthcare
- Artificial intelligence in paediatrics
- Predictive analytics and decision support
- Ethical and legal considerations
- Future trends in AI-supported healthcare

Week 11 — Financial Strategies, Contracts & Career Sustainability

- Salary and consultancy models
- Contract negotiation
- Financial planning
- Career sustainability
- Burnout prevention and work-life balance

Week 12 — Research and Development (R&D) within Higher Education

- Academic and research career pathways
- Research funding and grants
- Innovation and knowledge transfer
- Industry-academic collaborations
- Consultancy and research management

Week 13 — Capstone Career Pathway Presentations

- Student professional pathway presentations
- Career development reflection
- Peer and academic feedback
- Professional action planning
- Integration of employability and entrepreneurship principles

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching approaches. Teaching methods include: • live online lectures

	• interactive workshops • case-based learning • career simulation activities • discussion sessions • guest lectures from industry professionals • recorded educational material • guided independent study These activities are supported through university digital platforms for teleconferencing and asynchronous learning.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through: • weekly synchronous sessions • course discussion forums • email communication • scheduled virtual office hours • announcements on the digital learning platform
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through: • group discussion during live sessions • collaborative assignments • online discussion forums • peer feedback activities • breakout room discussions • digital collaborative tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • Teleconference platforms (Google Meet / Zoom) • HUA Moodle Learning Management System • Collaborative digital tools (Teams) • Online assessment systems • Digital presentation and portfolio tools
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and appropriately referenced. Students remain responsible for: • originality of submitted work • factual accuracy • ethical and responsible use of AI-generated content
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of*	

Activity	***Semester workload***
Synchronous lectures	39
Asynchronous recorded lectures	18
Study of lecture materials	42
Literature reading	25
Preparation of assignments	30
Assignment writing	20

independent study, according to the principles of the ECTS.

Career simulation and applied activities	13
Examination and assessment preparation	13
Course total	*200 hours*

STUDENT ASSESSMENT

Description of the assessment method

Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Description of the assessment method

Assessment is designed to evaluate students' ability to critically analyse professional opportunities, apply employability and entrepreneurial principles, and communicate professional strategies effectively within healthcare and wellbeing sectors.

The assessment strategy combines formative and summative approaches and includes written analytical work, professional portfolio development and recorded presentations.

All assessments are conducted in English.

The assessment approach emphasises:

- critical thinking
- applied professional knowledge
- strategic career planning
- entrepreneurship and innovation
- communication skills

Assessment methods include:

- professional portfolio development
- business and employability case studies
- reflective analysis
- recorded oral presentation
- applied problem-solving tasks
- participation in online learning activities

Assessments	**Weight**
Career pathway portfolio	**50%**
Employability case study	**20%**
Capstone Career Pathway Presentation	**30%**

Career Pathway Portfolio (50%)

Students prepare an individual professional portfolio (approximately 2500 words) outlining a realistic healthcare career or entrepreneurial pathway aligned with their academic background, interests and professional goals.

The portfolio includes:

- professional profile and career objectives
- employability analysis
- healthcare business or service model
- labour market analysis
- financial and operational considerations
- professional branding and digital presence strategy
- implementation and sustainability plan
- references

The portfolio emphasises critical reflection, strategic planning and evidence-based professional development.

Employability Case Study (20%)

	Students complete a structured applied analysis of a real-world healthcare employability or entrepreneurship scenario. The task may involve: • clinic or service development analysis • healthcare innovation evaluation • corporate wellbeing strategy • digital health implementation pathway • career transition planning • evaluation of healthcare business opportunities Submission format: 1000-word structured analysis report. **Capstone Career Pathway Presentation (30%)** Students deliver a recorded professional presentation (10–12 minutes) presenting their proposed career or entrepreneurial pathway. The presentation includes: • professional positioning and goals • career pathway justification • employability and business strategy • implementation plan • critical reflection on opportunities and challenges Students are expected to demonstrate: • strategic thinking • professional communication • evidence-based reasoning • clarity and feasibility of proposed pathway **Evaluation Criteria** Student performance is evaluated according to the following criteria: • quality and relevance of evidence used • critical analysis and strategic thinking • realism and feasibility of proposed pathways • application of employability and entrepreneurial principles • clarity and structure of written work • quality of oral presentation and communication • professionalism and reflective capacity **Accessibility of Evaluation Criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester. Students receive written and/or recorded feedback following submission of each assessment.

5. RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

The following textbooks and guidelines provide an overview of the scientific principles and applied practices related to exercise, physical activity and health in children and adolescents. Additional scientific articles will be provided throughout the course.

Career Development and Employability

- EURES European Job Mobility Portal — Healthcare and wellbeing jobs across Europe

- NHS Careers — UK healthcare career pathways
- DYPA – Greek Public Employment Service — Employment opportunities and professional development in Greece
- LinkedIn Jobs — International professional opportunities
- EURAXESS — European research and academic careers
- WHO Careers — Global public health and international organisation careers
- UNICEF Careers — Child health and NGO careers

Medicine and Healthcare Professions

- Panhellenic Medical Association — Medical profession and licensing in Greece
- General Medical Council (GMC) — UK medical registration and professional standards
- British Medical Association (BMA) — UK medical careers and contracts
- European Public Health Association (EUPHA) — European public health careers and policy
- World Health Organization — International health systems and policy resources

Nutrition, Exercise and Wellbeing Careers

- Hellenic Dietetic Association — Dietetics profession in Greece
- British Dietetic Association — UK dietetics careers and standards
- European Federation of the Associations of Dietitians (EFAD) — European dietetics network
- American College of Sports Medicine (ACSM) — Exercise science and clinical exercise careers
- British Association of Sport and Exercise Sciences (BASES) — UK sport science accreditation and careers
- International Society for Physical Activity and Health (ISPAH) — Global physical activity and public health resources

Psychology, Coaching and Behaviour Change

- Hellenic Psychological Society — Psychology profession in Greece
- British Psychological Society (BPS) — UK psychology careers and accreditation
- American Psychological Association (APA) — International psychology resources
- Motivational Interviewing Network of Trainers (MINT) — Coaching and behaviour change approaches

Entrepreneurship, Innovation and Private Practice

- Osterwalder, A., & Pigneur, Y. (2010). Business Model Generation.
- Ries, E. (2011). The Lean Startup.
- Elevate Greece — Greek innovation and startup ecosystem
- EIT Health — European healthcare innovation and startup ecosystem
- European Innovation Council — European startup and innovation funding
- NHS Innovation Service — UK healthcare innovation pathways

Digital Health and Artificial Intelligence

- Deep Medicine
- WHO Digital Health Guidelines
- WHO AI Ethics for Health
- European Health Data Space
- NHS Digital Technology Resources

Corporate Wellbeing and Occupational Health

- WHO Healthy Workplace Framework
- Global Wellness Institute
- Society of Occupational Medicine
- International Labour Organization Occupational Health Resources

Research, Funding and Academic Careers

- Horizon Europe
- UK Research and Innovation (UKRI)
- Marie Skłodowska-Curie Actions (MSCA)
- National Institute for Health and Care Research (NIHR)

Databases and Professional Resources

- PubMed
- Scopus
- Web of Science
- LinkedIn Learning
- OECD Health Statistics

HUAUOE011 - Human Health and Sustainable Nutrition: The Mediterranean Paradigm

1. GENERAL

SCHOOL	School of Health Science and Education, Harokopio University		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE011	SEMESTER	2nd Semester of Full-Time (FT) 2nd Year of Part-Time (PT)
COURSE TITLE	Human Health and Sustainable Nutrition: The Mediterranean Paradigm		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	Special background		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*

- *Brief Guide for drafting Learning Outcomes*

The aim of this course is to provide an in-depth understanding of the intersection of environment, food, and nutrition using the Mediterranean paradigm as a model for healthy and sustainable diets. The course explores how environmental, social, cultural, and biological factors shape dietary patterns and population health, with particular emphasis on children. It also examines the role of policies in improving the sustainability of food systems and addressing food insecurity.

Students are expected to develop the following:
Knowledge

- Recognise the importance of early-life and family-related factors in shaping long-term dietary behaviours and health outcomes.
- Evaluate the impact of climate change, urbanisation, and food environments on dietary behaviours and food insecurity.
- Describe the biological mechanisms linking diet, microbiome diversity, and non-communicable disease risk across the life course.
- Analyse the role of the Mediterranean diet as a model linking health, sustainability, and cultural legacy.

Skills

- Apply appropriate approaches and indicators for assessing dietary patterns for their efficacy to promote healthy sustainable diets.
- Interpret scientific literature related to social and economic determinants of food consumption with emphasis on Mediterranean contexts.
- Interpret dietary, environmental, and behavioural data in relation to health and sustainability outcomes
- Evaluate real-world policies and programmes (e.g., school meals, food innovation) using sustainability and equity lens.

Competences

- Critically appraise current international guidelines for sustainable diets in childhood.
- Develop interventions promoting sustainable nutrition in school and community settings.
- Communicate scientific knowledge effectively to childhood audiences.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
……

Adaptability to new situations
Decision-making
Respect for the natural environment
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Showing social, professional and ethical responsibility
Criticism and self-criticism
Production of creative and inductive thinking

3. COURSE SYLLABUS

This course provides a comprehensive, evidence-based overview of nutritional science, food studies and cultural studies to show the way Mediterranean eating habits offer solutions to contemporary ecological and health crises. Key topics include • Global nutritional concerns in children, malnutrition and obesity • Decline in the nutritional quality of foods and impacts on long-term health • Microbe diversity and human health • The global challenge of emerging infectious disease • Contemporary threats to modern diets • Local solutions for environmental, social and economic stability • Eco-friendly food production practices • Potential of traditional and innovative foods in promoting environmental sustainability and health • Resilience and food processing • Overview of the bioactive components and their sources in the Mediterranean diet • Mechanist and clinical insights into the Mediterranean diet and its ability to promote healthy growth of children • Fortified food in childhood nutrition, upgrading the Mediterranean staples • Mediterranean diet, an environmentally sustainable paradigm

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through a combination of synchronous and asynchronous methods, supported by digital technologies and the university's online learning platform (Moodle). This includes weekly live (synchronous) sessions, scheduled virtual office hours, and regular interaction through course discussion forums and email communication. In addition, announcements and learning materials are consistently uploaded on the Moodle platform, ensuring continuous and structured communication throughout the course.
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through: • group discussion during live sessions • collaborative assignments • online discussion forums • digital collaborative tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • Teleconference platform (Microsoft Teams) • Asynchronous learning platform (Moodle) • Collaborative digital tools • Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced.

(2) The use of Artificial Intelligence is allowed only with the permission of the instructor
(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature
(4) Students are free to use Artificial Intelligence

Students remain responsible for the originality and accuracy of their work.

ORGANISATION OF TEACHING

The mode and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.

The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.

Activity	*Semester workload (hours)*
Lectures	39
Study of lecture materials	50
Study and analysis of bibliography	31
Essay writing	40
Independent study	40
Course total	**200**

STUDENT ASSESSMENT

Description of the assessment method

Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Description of the assessment method

Assessment of the course is designed to evaluate students' ability to critically analyse scientific evidence, apply theoretical knowledge to practical contexts, and communicate scientific information effectively. The assessment approach emphasises critical thinking, evidence-based reasoning and applied knowledge, rather than factual recall.

Assessment methods include:

- Weekly quizzes (15% of final grade)
- Class engagement (15%)
- Final quiz (40% of final grade)
- Essay/report (30%)

Description of assessment tasks

Weekly quizzes: At the end of each lecture, the professor will give the students quizzes related to the course material, and the students will be required to answer them. The subject matter of the questions will relate to the general ideas developed during the lecture.
Class engagement: Students will be assessed on preparedness, active participation in discussions, reflective assignments, constructive engagement with peers during group activities and appropriate academic behaviour.
Final quiz: At the end of the course, students complete a final quiz designed to assess their understanding of key concepts covered throughout the module. The quiz consists of multiple-choice questions and short open-ended responses, focusing on the application and interpretation of knowledge rather than simple recall.
Essay/report: Essay assessment may include reflective essays, case-study based essays, comparative or argumentative essays which will cover all lectures and aspects of the course. Each lecturer will provide 2-3 essay topics related to his/her lecture.

Evaluation criteria

Student performance is evaluated according to the following criteria:

- quality and relevance of scientific literature

	• critical analysis and evaluation of evidence • application of knowledge to programme design • interpretation of data or case study • clarity and structure of written work • quality of presentation and communication • accuracy and completeness of responses to quiz questions. **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester.

5. RECOMMENDED BIBLIOGRAPHY

The following papers provide an overview of the scientific principles of the Mediterranean Diet as a Paradigm of prudent and sustainable dietary pattern.

- Asnicar, F., et al. (2025). Gut micro-organisms associated with health, nutrition and dietary interventions. Nature, 650, 450–458.
- Casas, R., Ruiz-León, A. M., Argente, J., Alasalvar, C., Bajoub, A., Bertomeu, I., Caroli, M., Castro-Barquero, S., Crispi, F., Delarue, J., Fernández-Jiménez, R., Fuster, V., Fontecha, J., Gómez-Fernández, P., González-Juste, J., Kanaka-Gantenbein, C., Kostopoulou, E., Lamuela-Raventós, R. M., Manios, Y., Marcos, A., Moreno, L. A., de Pascual-Teresa, S., Raidó-Quintana, B., Rivera-Ferre, M. G., Santos-Beneit, G., Shai, I., Spiliotis, B. E., Trichopoulou, A., Vania, A., Varela-Moreiras, G., Vila-Marti, A., Willett, W., Ros, E., & Estruch, R. (2025). A new Mediterranean lifestyle pyramid for children and youth: A critical lifestyle tool for preventing obesity and associated cardiometabolic diseases in a sustainable context. Advances in Nutrition, 16(3), Article 100381. https://doi.org/10.1016/j.advnut.2025.100381
- Food and Agriculture Organization, & World Health Organization. (2019). Sustainable healthy diets: Guiding principles. FAO.
- Food and Agriculture Organization. (2021). Sustainable food innovation in the Mediterranean. FAO.
- Garrity, K., Krzyzanowski Guerra, K., Hart, H., et al. (2024). Local food system approaches to address food and nutrition security among low-income populations: A systematic review. Advances in Nutrition, 15, Article 100156.
- Michel, M., Eldridge, A. L., Hartmann, C., Klassen, P., Ingram, J., & Meijer, G. W. (2024). Benefits and challenges of food processing in the context of food systems, value chains and sustainable development goals. Trends in Food Science & Technology, 153, Article 104703.
- Rahimah, S., Talei, T. E., et al. (2026). Functional foods and dietary matrices for metabolic improvement: An integrative review of mechanisms, evidence and future directions. Journal of Functional Foods, 139, Article 107240. https://doi.org/10.1016/j.jff.2026.107240
- Rivera-Navarro, J., Conde, P., et al. (2020). Urban environment and dietary behaviours as perceived by residents living in socioeconomically diverse neighbourhoods: A qualitative study in a Mediterranean context. Appetite, 157, Article 104983.
- Trichopoulou, A. (2021). Mediterranean diet as intangible heritage of humanity: 10 years on. Nutrition, Metabolism and Cardiovascular Diseases, 31(7), 1943–1951.
- UNICEF, World Health Organization, & World Bank Group. (2023). Levels and trends in child malnutrition: Key findings of the 2023 edition.
- Willett, W., et al. (2019). Food in the Anthropocene: The EAT–Lancet Commission on healthy diets from sustainable food systems. The Lancet, 393(10170), 447–492.

Term 3/Year 3 Modules

HUAUOE015 - Dissertation

1. GENERAL

SCHOOL	School of Health Sciences and Education, Harokopio University		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE015	**SEMESTER**	**3rd Semester of Full-Time (FT)** **3rd Year of Part-Time (PT)**
COURSE TITLE	Dissertation / Research Article		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Research supervision, statistical seminars, independent research and dissertation preparation		FT: Individual supervision throughout semester PT: Monthly supervision meetings	15
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	Specialised scientific research, independent study, skills development and applied research training.		
PREREQUISITE COURSES	Successful completion of core modules of the MSc programme.		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% The dissertation is delivered through supervised independent research supported by synchronous online supervision meetings and asynchronous research activities. Synchronous activities include: • individual supervision meetings • dissertation workshops • research seminars • progress presentations • methodological support sessions Asynchronous activities include: • independent literature review • data analysis • dissertation writing • online learning resources • self-directed research activities		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		

COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

Knowledge

- Critically evaluate scientific literature related to children's health, exercise, nutrition, wellbeing and digital technologies.
- Demonstrate advanced understanding of quantitative, qualitative or mixed-methods research methodologies.
- Explain ethical, legal and methodological principles relevant to health-related research.
- Analyse complex health-related datasets and interpret findings appropriately.
- Understand principles of scientific dissemination and evidence-based practice.

Skills

- Develop an independent research proposal and research question.
- Conduct systematic literature searches and evidence synthesis.
- Apply appropriate research methodologies and statistical or qualitative analytical techniques.
- Critically interpret research findings within scientific and clinical contexts.
- Produce a scientifically structured dissertation following academic conventions.
- Present and defend research findings effectively to academic audiences.

Competences

- Conduct independent scientific research at postgraduate level.
- Demonstrate critical thinking and scientific reasoning.
- Integrate interdisciplinary knowledge into applied research.
- Demonstrate professional, ethical and responsible conduct in research practice.
- Manage research projects independently within agreed timelines.
- Reflect critically on research limitations, implications and future directions.

Learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
……

The dissertation aims to develop the following competences:

- Search, analysis and synthesis of data and information with the use of necessary technologies
- Decision-making
- Working independently
- Teamwork and interdisciplinary collaboration

- Working in international scientific environments
- Research design and project management
- Critical thinking and self-reflection
- Production of new research ideas
- Scientific writing and communication
- Ethical and professional responsibility
- Creativity and inductive thinking

3. COURSE SYLLABUS

The dissertation represents the independent research component of the MSc programme. It provides students with the opportunity to apply research, analytical and scientific writing skills to a topic within children's health, exercise, nutrition, wellbeing, public health, digital health or artificial intelligence.

The dissertation will primarily use existing datasets and databases rather than primary data collection. Projects may include:

- secondary dataset analysis
- epidemiological analysis
- public health surveillance data analysis
- systematic reviews
- scoping reviews
- meta-analyses
- digital health and wearable data analysis
- AI-assisted health data interpretation
- evaluation of existing intervention datasets

Indicative Dissertation Areas

- physical activity and sedentary behaviour in children and adolescents
- nutrition and dietary assessment
- childhood obesity prevention and management
- mental health and wellbeing
- digital health technologies
- artificial intelligence in child and family health
- public health surveillance
- school-based health promotion
- behaviour change and lifestyle medicine
- health inequalities and vulnerable populations
- corporate and occupational wellbeing
- secondary analysis of cohort or registry data

Indicative Data Sources

Students may use publicly available, institutional or approved datasets, such as:

- Existing datasets of European, UK and Global research projects
- OECD Health Statistics
- UK Biobank
- ALSPAC
- NHANES
- HBSC
- PANIC study
- Active Healthy Kids Global Alliance data
- national health surveys
- school-based health datasets
- wearable and accelerometer datasets
- clinical or public health registries, subject to permissions

Dissertation Stages

Stage 1 — Topic Development and Proposal

- identification of research area
- development of research question and aims
- initial literature review
- feasibility assessment
- proposal preparation

Stage 2 — Ethics, Governance and Methodology

- research ethics and GDPR
- secondary data governance
- methodological design
- statistical or review protocol development
- supervisor approval

Stage 3 — Secondary Data Analysis and Evidence Synthesis

- dataset familiarisation
- data cleaning and variable selection
- statistical or thematic analysis
- systematic or scoping review methods
- interpretation of findings

Stage 4 — Dissertation Writing

- introduction and literature review
- methodology
- results
- discussion
- conclusions
- referencing and appendices

Stage 5 — Scientific Presentation and Reflection

- oral presentation of findings
- response to academic questions
- reflection on implications, limitations and future research

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning through supervised independent research. Teaching methods include: • individual supervision meetings • online research seminars • methodological workshops • statistical support sessions • guided independent study • literature review activities • secondary data analysis • peer discussion and feedback • dissertation progress presentations
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication is conducted through: • scheduled supervision meetings • dissertation progress reviews • email communication • online office hours • Moodle announcements • discussion forums
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS	Student interaction is supported through: • research seminars • peer feedback sessions • online discussion groups • dissertation progress presentations

Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.	• collaborative digital tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools include: • HUA Moodle LMS • Zoom / Google Meet / Microsoft Teams • statistical software such as SPSS, R or Jamovi • reference management tools • online databases • systematic review tools such as Rayyan or Covidence where available
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students require: • computer or laptop • reliable internet connection • webcam and microphone • access to university digital platforms • access to statistical or reference management software
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All dissertations are checked using Turnitin or equivalent plagiarism detection software. Students must comply with university regulations on: • plagiarism • academic integrity • research ethics • authorship • referencing • responsible data use
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	Use of Artificial Intelligence tools is allowed only when clearly acknowledged and appropriately referenced. Students remain responsible for: • originality of submitted work • factual accuracy • correct interpretation of data • ethical and responsible use of AI • compliance with research governance and GDPR
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	

Activity	*Semester workload*
Individual supervision meetings	15 h
Research seminars and methodological workshops	15 h
Literature review and reading	75 h
Research design, protocol and ethics/governance preparation	35 h
Dataset familiarisation and data management	50 h
Statistical analysis / evidence synthesis	80 h
Dissertation writing	100 h
Presentation preparation	15 h
Independent study and revisions	15 h
Dissertation Total	400 h

STUDENT ASSESSMENT

Description of the assessment method

Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Description of Assessment Method

Assessment evaluates the student's ability to design, conduct, analyse and communicate an independent postgraduate research project using existing datasets, secondary data, public health databases or evidence synthesis methods.

All assessments are conducted in English.

Assessment focuses on:

- research question development
- methodological appropriateness
- quality of analysis
- interpretation of findings
- scientific writing
- critical reflection
- oral communication

Assessments	**Weight**
Written Dissertation / Research Article	**70%**
Oral Presentation / Viva	**30%**

Written Dissertation / Research Article – 70%

Students submit an individual dissertation in the format of a scientific research article suitable for publication.

The dissertation should be approximately 4,000 words excluding references, tables, figures and appendices.

The research article format normally includes:

- Title
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Conclusions
- References
- Tables and Figures

The dissertation may involve:

- secondary dataset analysis
- epidemiological analysis
- systematic or scoping reviews
- digital health and wearable datasets
- public health surveillance data
- AI-supported health data analysis

Students are expected to demonstrate:

- critical evaluation of literature
- methodological rigor
- appropriate analytical methods
- interpretation of findings
- scientific writing quality
- ethical and responsible use of data

	Oral Presentation / Viva – 30% Students deliver a 15 minute oral presentation and discussion of their dissertation project. The presentation includes: ● background and rationale ● research aims and objectives ● methodology and analytical approach ● presentation of key findings ● interpretation and implications ● strengths and limitations ● future recommendations Students are expected to demonstrate: ● scientific understanding of the topic ● critical interpretation of findings ● ability to justify methodological and analytical choices ● professional presentation and communication skills ● ability to respond critically to academic questions **Evaluation Criteria** Student performance is evaluated according to: ● originality and relevance of research topic ● quality of literature review ● methodological appropriateness ● quality of data analysis or evidence synthesis ● interpretation and discussion of findings ● scientific writing quality ● presentation quality and communication skills ● critical reflection and defence of research ● ethical and responsible research conduct ● appropriate use of references and datasets **Accessibility of Evaluation Criteria** Detailed dissertation guidelines, assessment rubrics, formatting requirements and submission instructions are made available to students through the course digital learning platform at the beginning of the semester. Students receive formative feedback during scheduled supervision meetings and summative written and/or recorded feedback following submission of the written dissertation and oral presentation. Assessment criteria, deadlines and presentation requirements are communicated clearly through Moodle and during dissertation workshops and supervision sessions.

5. RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

The following textbooks and guidelines provide an overview of the scientific principles and applied practices related to exercise, physical activity and health in children and adolescents. Additional scientific articles will be provided throughout the course.

Scientific Writing and Research Articles

- Murray, R. (2017). *How to Write a Thesis* (4th ed.). Open University Press.
- Day, R. A., & Gastel, B. (2022). *How to Write and Publish a Scientific Paper* (9th ed.). Cambridge University Press.

- Silvia, P. J. (2018). *How to Write a Lot: A Practical Guide to Productive Academic Writing* (2nd ed.). American Psychological Association.
- Greenhalgh, T. (2019). *How to Read a Paper: The Basics of Evidence-Based Medicine and Healthcare* (6th ed.). Wiley-Blackwell.
- Elsevier Researcher Academy – Scientific Writing
- Springer Nature Author Academy
- BMJ Research to Publication Programme

Presentation and Scientific Communication Skills

- Alley, M. (2013). *The Craft of Scientific Presentations* (2nd ed.). Springer.
- Reynolds, G. (2019). *Presentation Zen: Simple Ideas on Presentation Design and Delivery* (3rd ed.). New Riders.
- TED Talks – Presentation Skills
- Nature Masterclasses – Research Communication
- Elsevier Researcher Academy – Presenting Research

Statistics and Data Analysis

- Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics* (5th ed.). Sage Publications.
- Pallant, J. (2020). *SPSS Survival Manual* (7th ed.). McGraw-Hill Education.
- Tabachnick, B. G., & Fidell, L. S. (2019). *Using Multivariate Statistics* (7th ed.). Pearson.
- Motulsky, H. (2022). *Intuitive Biostatistics* (4th ed.). Oxford University Press.
- IBM SPSS Tutorials
- Laerd Statistics
- StatQuest with Josh Starmer
- CrashCourse Statistics
- jamovi Statistical Software
- JASP Statistical Software
- R Project for Statistical Computing
- RStudio / Posit

Systematic Reviews and Evidence Synthesis

- Higgins, J. P. T., Thomas, J., Chandler, J., et al. (2023). *Cochrane Handbook for Systematic Reviews of Interventions* (Version 6.4). Cochrane.
- Aromataris, E., & Munn, Z. (2020). *JBI Manual for Evidence Synthesis*. Joanna Briggs Institute.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., et al. (2021). The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *BMJ*, 372, n71.
- PRISMA 2020 Guidelines
- Cochrane Interactive Learning
- Joanna Briggs Institute Evidence Synthesis
- Rayyan Systematic Review Tool

Research Ethics and Open Science

- World Medical Association. (2013). Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects. *JAMA*, 310(20), 2191–2194.
- Declaration of Helsinki
- UK Research Integrity Office
- Open Science Framework
- GDPR Information Portal

Reference Management and Academic Tools

- Mendeley
- Zotero
- EndNote
- Connected Papers
- ResearchRabbit

Scientific Databases and Data Sources

- PubMed
- Scopus
- Web of Science
- Cochrane Library
- WHO Global Health Observatory
- OECD Health Statistics
- UK Biobank
- ALSPAC
- NHANES
- HBSC Study

Optional Modules – Term 3 Pool (students select 2 from 4)

UOEHUA005 - Digital Health Ecosystems in Schools and Families

1. GENERAL

SCHOOL	University of Exeter Medical School		
ACADEMIC UNIT	Department of Public Health and Sport Sciences		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	UOEHUA005	**SEMESTER**	3rd Semester of Full-Time (FT) 3rd Year of Part-Time(PT)
COURSE TITLE	Digital Health Ecosystems in Schools and Families		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	This course provides students with an advanced understanding of digital health ecosystems designed to support the health, wellbeing, development and educational outcomes of children, adolescents and families. The module critically examines the integration of digital health technologies, artificial intelligence, wearable devices, remote monitoring, behavioural science, public health, paediatric healthcare and school-based systems. The module reflects current international priorities in digital health, which emphasise strengthening health systems through digital technologies, supported by appropriate financial, organisational, human and technological resources. It also reflects emerging paediatric digital health priorities, including child-centred design, evaluation of digital interventions, benefits and risks for children, and the development of digital ecosystems for paediatric health and wellbeing.		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is		

	delivered through the university learning management system.
AVAILABILITY TO ERASMUS STUDENTS	Yes.
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).

4. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

On successful completion of this course students will be able to:

- Critically evaluate current evidence relating to digital health ecosystems for children, adolescents, schools and families.
- Demonstrate understanding of digital health technologies, wearable systems, mobile applications, dashboards, AI-supported tools and remote monitoring systems used in school and family settings.
- Critically examine behavioural science, implementation science, public health and educational theories underpinning digital health interventions.
- Evaluate the effectiveness, feasibility, acceptability and scalability of digital health interventions targeting movement behaviours, nutrition, mental health, sleep, wellbeing and family health.
- Understand ethical, legal, safeguarding and data governance considerations associated with digital health technologies involving children and adolescents.
- Critically evaluate research methodologies and implementation frameworks relevant to paediatric digital health and school-based digital ecosystems.

Skills

Students will be able to:

- Critically analyse digital health opportunities and challenges within schools, families and child health systems.
- Apply theoretical and evidence-based approaches to the design of digital health interventions and ecosystems.
- Interpret digital health data, implementation outcomes, user engagement metrics and evaluation studies.
- Develop evidence-based recommendations for school and family digital health programmes.
- Design practical, ethical and scalable digital ecosystem approaches for child and adolescent health promotion.
- Critically evaluate digital engagement, accessibility, interoperability, safeguarding and health equity issues.

Competences

Students will be able to:

- Apply interdisciplinary perspectives to digital health ecosystem development.
- Critically evaluate digital health systems implemented within schools, communities and family environments.
- Demonstrate ethical and professional awareness regarding digital health, AI, child data protection and responsible innovation.
- Integrate policy, behavioural science, public health, paediatric healthcare and educational perspectives into digital health strategies.
- Communicate evidence-based digital health concepts effectively in academic,

professional and entrepreneurial contexts.

- Recognise implementation barriers and facilitators influencing adoption, sustainability and commercial translation of digital health ecosystems.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
… …
Other…
… …

The course aims to promote:
• Search, analysis and synthesis of data and information, with the use of the necessary technology
• Adaptability to new situations
• Decision-making
• Working independently
• Team work
• Working in an international environment
• Working in an interdisciplinary environment
• Production of new research ideas
• Project planning and management
• Respect for difference and multiculturalism
• Respect for ethical, legal and safeguarding principles
• Showing social, professional and ethical responsibility and sensitivity to gender and equity issues
• Criticism and self-criticism
• Production of free, creative and inductive thinking
• Digital literacy and technological competence
• Responsible use of AI and data-driven health technologies
• Innovation and entrepreneurship in child health and wellbeing

5. COURSE SYLLABUS

This course introduces students to the design, implementation and evaluation of digital health ecosystems for children, adolescents, schools and families. It examines how digital platforms, wearable technologies, AI-supported tools, digital education systems and family-centred interventions can support prevention, monitoring, behaviour change and wellbeing promotion.

The module is informed by global digital health priorities from WHO, paediatric digital health developments from RCPCH and BRCCH, and evidence on children's use of digital technologies in learning and development from Open University OpenLearn. The Open University course specifically examines children's use of mobile applications, digital games and computers, and discusses debates around screen time, learning and development.

Indicative Weekly Topics

Lecture 1 – Introduction to Digital Health Ecosystems
• Definitions of digital health and digital ecosystems
• Digital transformation in child health, education and family wellbeing
• Schools and families as connected health environments
• Public health, prevention and health system perspectives

Lecture 2 – Children's Experiences with Digital Technologies
- Children's use of apps, games, computers and online platforms
- Digital learning, play and development
- Screen time debates and evidence interpretation
- Digital literacy for children, parents and educators

Lecture 3 – Behavioural Science and Digital Health
- COM-B and Behaviour Change Wheel
- Digital nudging and persuasive design
- Gamification and engagement
- Behaviour change maintenance in school and family settings

Lecture 4 – Wearables, Sensors and Remote Monitoring
- Accelerometers, smartwatches and wearable devices
- Sleep, physical activity and sedentary behaviour monitoring
- Digital biomarkers and physiological signals
- Feasibility, acceptability and data quality

Lecture 5 – School-Based Digital Health Systems
- School health dashboards
- Digital screening and early identification
- Integration with school wellbeing and safeguarding systems
- Teacher, parent and student-facing reports

Lecture 6 – Family-Centred Digital Health
- Parent engagement and family behaviour change
- Home-based digital interventions
- Digital coaching and feedback loops
- Co-design with families and children

Lecture 7 – Paediatric Digital Health and Clinical Integration
- Digital paediatrics and child health innovation
- Connecting schools, families and healthcare systems
- Referral pathways and hybrid care models
- Lessons from RCPCH and paediatric digital health systems

Lecture 8 – Artificial Intelligence in Child and Family Health
- AI-supported risk stratification
- Personalised recommendations
- Predictive analytics and child wellbeing
- Responsible, explainable and safe AI

Lecture 9 – Digital Mental Health and Wellbeing
- Youth digital mental health tools
- Social media, wellbeing and online risk
- Digital resilience and safeguarding
- Integration with school mental health systems

Lecture 10 – Nutrition, Physical Activity and Lifestyle Technologies
- Digital dietary assessment
- Movement behaviour platforms
- Obesity prevention and family lifestyle tools
- Integration of health data into personalised feedback

Lecture 11 – Implementation Science and Real-World Evaluation
- Feasibility, acceptability and usability

- RE-AIM and implementation frameworks
- Evaluation across schools and families
- Scaling digital health ecosystems

Lecture 12 – Ethics, Governance and Child Data Protection
- GDPR and child data protection
- Digital safeguarding
- Equity, access and inclusion
- Commercialisation, trust and responsible innovation

Lecture 13 – Future Digital Health Ecosystems and Market Translation
- Precision public health
- AI-enabled school and family dashboards
- Digital twins, remote monitoring and connected care
- Commercial models for school, family, municipality and corporate wellbeing ecosystems

6. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching. Teaching includes: • live online lectures • recorded lectures • interactive discussion sessions • case-based learning • digital ecosystem design workshops • guided independent study • applied market and implementation analysis These activities are supported through the university's digital platforms for teleconferencing and asynchronous learning.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through: • weekly synchronous sessions • course discussion forums • email communication • scheduled virtual office hours • announcements on the digital learning platform
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Communication with students is conducted through: • weekly synchronous sessions • course discussion forums • email communication • scheduled virtual office hours • announcements on the digital learning platform
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • Teleconference platform: Microsoft Teams / Zoom • Asynchronous learning platform Moodle • Collaborative digital tools • Online assessment systems • Digital health dashboards and case-study platforms • AI-supported tools for learning, literature search and digital ecosystem design, where appropriately acknowledged
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection

	• webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality, accuracy, validity and academic integrity of their work. Use of AI must not replace critical analysis, independent reasoning or appropriate citation of scientific evidence.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	

Activity	Semester workload
Synchronous lectures	13
Asynchronous recorded lectures	26
Study of lecture materials	55
Literature reading	35
Digital ecosystem case-study analysis	20
Preparation of assignments	25
Assignment writing	26
Course total	200 hours

STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Assessment of the course is designed to evaluate students' ability to critically analyse digital health evidence, apply theoretical knowledge to real-world school and family contexts, and design feasible, ethical and scalable digital health ecosystem solutions. The assessment strategy combines formative and summative assessment methods and includes written analytical work, applied digital ecosystem analysis and market-facing implementation thinking. All assessments are conducted in English. The assessment approach emphasises critical thinking, evidence-based reasoning, applied implementation, ethical awareness and translational relevance. **Assessment methods include:** • analytical written essay • digital health ecosystem case study • literature review • critical evaluation of scientific evidence • implementation and market analysis • problem-solving tasks • participation in online learning activities **Assessments**

Assessment	**Weight**
Written analytical essay	50%
Applied digital health ecosystem case study	50%

Description of assessment tasks

	Written analytical essay – 50% Students critically evaluate a contemporary issue related to digital health ecosystems for children, adolescents, schools or families using current scientific literature, theoretical frameworks and policy guidance. Indicative topics may include: • AI in child health and wellbeing • school health dashboards • digital mental health for adolescents • wearables and child health monitoring • digital inequalities and child data protection • family-centred digital health interventions • digital technologies, screen time and child development Submission format: 2,000-word analytical essay. **Applied digital health ecosystem case study – 50%** Students analyse or design a real-world digital health ecosystem for schools, families, municipalities or paediatric health services. The task may involve: • analysing a digital health product, platform or ecosystem • designing a school-family health dashboard • developing an implementation plan for a child health digital platform • evaluating engagement, ethics, safeguarding and scalability • proposing a market-facing digital health solution relevant to Delta Life-type services Submission format: 1,500-word structured case-based essay. **Optional formative assessment** Students may prepare a formative concept map or ecosystem map showing how digital tools, users, data flows, intervention components, governance and outcomes interact within a school-family digital health ecosystem. Equivalent length: 750-word equivalent. Feedback method: Written feedback. **Evaluation criteria** Student performance is evaluated according to the following criteria: • quality and relevance of scientific literature • critical analysis and evaluation of evidence • application of theory and evidence to digital ecosystem design • understanding of implementation, ethics and data governance • interpretation of digital health case studies • feasibility and scalability of recommendations

	• clarity and structure of written work • quality of scientific and professional communication **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester. Students receive written feedback following submission of each assessment.

7. RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

The following textbooks, guidelines, policy documents and scientific resources provide an overview of digital health, paediatric digital health, child development in digital environments, behavioural science, implementation science, ethics, AI and digital health ecosystems in schools and families. Additional scientific articles and contemporary reports will be provided throughout the course.

Digital Health Strategy, Policy and Ecosystem Frameworks
World Health Organization (WHO)
Digital Health
https://www.who.int/health-topics/digital-health
World Health Organization (WHO)
Global Strategy on Digital Health 2020–2025
https://www.who.int/publications/i/item/9789240020924
European Commission
Digital Health and Care
https://health.ec.europa.eu/ehealth-digital-health-and-care/digital-health-and-care_en
OECD
Digital Health
https://www.oecd.org/health
PAHO
8 Principles for Digital Transformation of Public Health
https://www.paho.org/en/information-systems-and-digital-health/8-principles-digital-transformation-public-health
Children's Experiences with Digital Technologies
https://www.open.edu/openlearn/education-development/childrens-experiences-digital-technologies/content-section-0
Childhood in the Digital Age
https://www.open.edu/openlearn
UNICEF
Children in a Digital World
https://www.unicef.org
UNICEF
The State of the World's Children: Children in a Digital World
https://www.unicef.org/reports/state-worlds-children-2017
Ofcom
Children and Parents: Media Use and Attitudes Reports
https://www.ofcom.org.uk
Digital Futures Commission
Children, Technology and Wellbeing Reports
https://www.5rightsfoundation.com
Paediatric Digital Health and Clinical Innovation
Royal College of Paediatrics and Child Health (RCPCH)
Digital Health
https://www.rcpch.ac.uk/topic/digital-health
Royal College of Paediatrics and Child Health (RCPCH)
Digital Health Hub
https://www.rcpch.ac.uk/resources/digital-health-hub
Royal College of Paediatrics and Child Health (RCPCH)
Digital Paediatrics 2025
https://www.rcpch.ac.uk/resources/digital-paediatrics-2025
Basel Research Centre for Child Health
BRCCH Course on Foundations of Paediatric Digital Health
https://brc.ch/brcch-course-on-foundations-of-paediatric-digital-health/
NIHR Children and Young People MedTech Co-operative
Digital Health and Child Health Innovation Resources
https://www.cypmedtech.nihr.ac.uk

Digital Health Technologies and Evaluation
CONSORT-EHEALTH
Reporting Guidelines for Digital Health Trials
https://www.jmir.org
mHealth Evidence Reporting and Assessment Checklist
https://www.jmir.org
RE-AIM Framework
https://re-aim.org
Medical Research Council
Developing and Evaluating Complex Interventions
https://www.ukri.org
Digital Health Evidence Standards Framework
National Institute for Health and Care Excellence
https://www.nice.org.uk
Behaviour Change, Engagement and Implementation
Michie, S., Atkins, L., & West, R.
The Behaviour Change Wheel: A Guide to Designing Interventions.
Michie, S., van Stralen, M. M., & West, R.
The Behaviour Change Wheel: A New Method for Characterising and Designing Behaviour Change Interventions.
Hagger, M. S., Cameron, L. D., Hamilton, K., Hankonen, N., & Lintunen, T.
The Handbook of Behavior Change. Cambridge University Press.
Fernandez, M. E., Ruiter, R. A. C., Markham, C. M., & Kok, G.
Intervention Mapping: Theory- and Evidence-Based Health Promotion Program Planning.
Skivington, K., Matthews, L., Simpson, S. A., et al.
A New Framework for Developing and Evaluating Complex Interventions: Update of Medical Research Council Guidance.
AI, Ethics and Data Governance
European Commission
Ethics Guidelines for Trustworthy AI
https://digital-strategy.ec.europa.eu
European Union
EU AI Act
https://artificialintelligenceact.eu
UK Information Commissioner's Office
Children's Code / Age Appropriate Design Code
https://ico.org.uk
WHO
Ethics and Governance of Artificial Intelligence for Health
https://www.who.int
WHO
Regulatory Considerations on Artificial Intelligence for Health
https://www.who.int

Books
Topol, E. (2019). Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. Basic Books.
Wachter, R. M. (2015). The Digital Doctor: Hope, Hype, and Harm at the Dawn of Medicine's Computer Age. McGraw-Hill.
Piwek, L., Ellis, D. A., Andrews, S., & Joinson, A. (2016). The Rise of Consumer Health Wearables: Promises and Barriers. PLOS Medicine.
Lupton, D. (2016). The Quantified Self. Polity Press.
Lupton, D. (2020). Data Selves: More-than-Human Perspectives. Polity Press.
Greenhalgh, T., Wherton, J., Papoutsi, C., et al. Digital health implementation and complexity science publications.

Key Peer-Reviewed Journals
- Digital Health
- Journal of Medical Internet Research
- JMIR Pediatrics and Parenting
- npj Digital Medicine
- The Lancet Digital Health
- BMC Digital Health
- Frontiers in Digital Health
- International Journal of Medical Informatics
- Journal of Adolescent Health
- Child and Adolescent Mental Health
- School Mental Health
- International Journal of Behavioral Nutrition and Physical Activity

Students should consult
- PubMed – https://pubmed.ncbi.nlm.nih.gov
- PsycINFO – https://www.apa.org/pubs/databases/psycinfo
- Web of Science – https://www.webofscience.com
- Scopus – https://www.scopus.com

- Google Scholar – https://scholar.google.com
- IEEE Xplore – https://ieeexplore.ieee.org
- ACM Digital Library – https://dl.acm.org

HUAUOE012 - Sports Nutrition for Young Athletes

1. GENERAL

SCHOOL	School of Health Science and Education, Harokopio University		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE012	**SEMESTER**	3rd Semester of Full-Time (FT) 3rd Year of Part-Time (PT)
COURSE TITLE	Sports Nutrition for Young Athletes		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	Specialization / skills development		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

The aim of the course is to provide an evidence-based understanding of sports nutrition in children and adolescents, with emphasis on growth, maturation, health, performance, and the practical design of nutrition strategies for young athletes across training, competition, recovery, and special clinical situations.

Students are expected to develop the following:

Knowledge

- Explain the physiological, developmental, and nutritional characteristics of child and adolescent athletes.
- Describe energy systems, substrate use, and age-related determinants of performance in youth sport.
- Discuss evidence-based recommendations for energy, macronutrient, micronutrient, and fluid intake in young athletes.
- Recognise the nutritional implications of body composition goals, low energy availability, REDs, injury, and selected medical conditions in pediatric sport.

Skills

- Assess growth, maturation, body composition, dietary intake, hydration status, and energy needs in young athletes.
- Interpret scientific literature and current guidelines relevant to pediatric sports nutrition.
- Design individualized nutrition plans for training, competition, recovery, and return-to-play contexts.
- Evaluate the safety, efficacy, and ethical considerations of supplement use in youth sport.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
…….

- Search, analysis and synthesis of data and information with the use of necessary technologies
- Adaptability to new situations
- Decision-making
- Working independently
- Team work
- Working in an international environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Project planning and management
- Showing social, professional and ethical responsibility
- Criticism and self-criticism
- Production of creative and inductive thinking

3. COURSE SYLLABUS

This course introduces the scientific principles and applied practices of sports nutrition for children and adolescents engaged in organized sports and regular training. It examines nutritional requirements in relation to growth, maturation, energy metabolism, performance, hydration, recovery, supplement use, body composition, injury, behavior, strength development, and medical considerations in youth athletes.

Key topics include:

- Assessment of growth, maturation and energy needs in young athletes

- Energy systems and performance
- Macronutrient Requirements for Young Athletes
- Key micronutrients for growth and performance
- Hydration Strategies for Pediatric Sports Performance
- Nutrition for Training, Competition, and Recovery
- Safe and Evidence-Based Use of Supplements for young athletes
- Nutrition for Injury Prevention and Recovery in Young Athletes
- Psychological and Behavioral Aspects of Sports Nutrition in Children
- Body composition and REDs in youth
- Designing Personalized Nutrition Plans for the Pediatric Athlete
- Strength training in childhood and adolescence: Talent identification / Early specialization or long-term diversification
- Nutrition in young athletes with medical conditions

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through weekly live sessions, scheduled virtual office hours, discussion forums, and email communication supported by the university learning platform.
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through group discussion during live sessions, collaborative assignments, and online discussion forums.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • Teleconference platform (Microsoft Teams) • Asynchronous learning platform (Moodle) • Collaborative digital tools • Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection • webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.*	

Activity	***Semester workload (hours)***
Lectures	39
Study of lecture materials	50

The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.	Essay writing	61
	Independent study	50
	Course total	**200**

STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	**Description of the assessment method** Assessment of the course is designed to evaluate students' ability to critically analyse scientific evidence, apply theoretical knowledge to practical contexts, and communicate scientific information effectively. The assessment approach emphasises critical thinking, evidence-based reasoning and applied knowledge, rather than factual recall. **Assessment methods include:** ● applied scientific report and presentation (70% of final grade) ● final quiz (30% of final grade) **Description of assessment tasks** <u>Applied scientific report and presentation</u> Students prepare a scientific report in journal-article format (2000 words) designing an evidence-based nutrition strategy, case analysis, or applied support plan for a pediatric athlete or youth sport setting. Students also submit a 10-minute recorded presentation summarising the key elements of the project. <u>Final quiz</u> At the end of the course, students complete a final quiz designed to assess their understanding of key concepts covered throughout the module. The quiz consists of multiple-choice questions and short open-ended responses, focusing on the application and interpretation of knowledge rather than simple recall. **Evaluation criteria** Evaluation criteria include quality of literature use, critical analysis, application of knowledge, interpretation of case data, clarity of written work, and quality of presentation. **Accessibility of evaluation criteria** Detailed assessment guidelines, marking rubrics and submission instructions are made available to students through the course digital learning platform at the beginning of the semester.

5. RECOMMENDED BIBLIOGRAPHY

Indicative textbooks, consensus statements, and professional guidance relevant to sports nutrition in children and adolescents include:

- Thomas, D. T., Erdman, K. A., & Burke, L. M. (2016). Position of the Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and athletic performance.
- Mountjoy, M., et al. (2023). IOC consensus statement on Relative Energy Deficiency in Sport (REDs).
- Capra ME, Stanyevic B, Giudice A, Monopoli D, Decarolis NM, Esposito S, Biasucci G. Nutrition for Children and Adolescents Who Practice Sport: A Narrative Review. Nutrients. 2024 Aug 22;16(16):2803. doi: 10.3390/nu16162803. PMID: 39203939; PMCID: PMC11357223.
- Desbrow B, McCormack J, Burke LM, Cox GR, Fallon K, Hislop M, Logan R, Marino N, Sawyer SM, Shaw G, Star A, Vidgen H, Leveritt M. Sports Dietitians Australia position statement: sports nutrition for the adolescent athlete. Int J Sport Nutr Exerc Metab. 2014 Oct;24(5):570-84. doi: 10.1123/ijsnem.2014-0031. Epub 2014 Mar 25. PMID: 24668620.

- Everett S. Optimizing Performance Nutrition for Adolescent Athletes: A Review of Dietary Needs, Risks, and Practical Strategies. Nutrients. 2025 Aug 28;17(17):2792. doi: 10.3390/nu17172792. PMID: 40944181; PMCID: PMC12430154.
- Alcock R, Hislop M, Vidgen HA, Desbrow B. Youth and Adolescent Athlete Musculoskeletal Health: Dietary and Nutritional Strategies to Optimise Injury Prevention and Support Recovery. J Funct Morphol Kinesiol. 2024 Nov 5;9(4):221. doi: 10.3390/jfmk9040221. PMID: 39584874; PMCID: PMC11587028.
- Desbrow B, Burd NA, Tarnopolsky M, Moore DR, Elliott-Sale KJ. Nutrition for Special Populations: Young, Female, and Masters Athletes. Int J Sport Nutr Exerc Metab. 2019 Mar 1;29(2):220-227. doi: 10.1123/ijsnem.2018-0269. Epub 2019 Feb 15. PMID: 30632423.
- Suh H, Kavouras SA. Water intake and hydration state in children. Eur J Nutr. 2019 Mar;58(2):475-496. doi: 10.1007/s00394-018-1869-9. Epub 2018 Nov 30. PMID: 30506317.
- Armstrong, N., & Van Mechelen, W. (2023). Oxford Textbook of Children's Sport and Exercise Medicine (4th ed.). Oxford University Press.

Books

- Armstrong, N., & Van Mechelen, W. (2023). Oxford Textbook of Children's Sport and Exercise Medicine (4th ed.). Oxford University Press.
- Bagchi, D., Nair, S., & Sen, C. K. (Eds.). (2018). Nutrition and Enhanced Sports Performance (2nd ed.). Academic Press.
- Malina, R. M., Bouchard, C., & Bar-Or, O. (2004). Growth, Maturation and Physical Activity (2nd ed.). Human Kinetics.
- Faigenbaum, A. D., & Myer, G. D. (2020). Youth Resistance Training: Concepts and Applications. Human Kinetics.
- Lloyd, R. S., & Oliver, J. L. (2019). Strength and Conditioning for Young Athletes: Science and Application. Routledge.
- Rowland, T. W. (2017). Children's Exercise Physiology (2nd ed.). Human Kinetics.American Academy of Pediatrics. Sports and nutrition guidance statements and clinical reports.
- American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription (latest edition).
- Sports Nutrition/ Asker Jeukendrup, Michael Gleeson. Human Kinetics. (latest edition).
- Nutrition for health, fitness, and sport. Twelfth edition / Eric S. Rawnson, J. David Branch, Tammy J. Stephenson. McGraw Hill Higher Education, [2020]
- BDA Sports Dietitians / Sport and Exercise Nutrition Register resources on youth sports nutrition.

Additional current review papers and consensus statements will be provided throughout the semester.

The following textbooks and guidelines provide an overview of the scientific principles and applied practices related to exercise, physical activity and health in children and adolescents. Additional scientific articles will be provided throughout the course.

Physical Activity Guidelines

- *World Health Organization (WHO)*
  Global Guidelines on Physical Activity and Sedentary Behaviour (2020)
- *https://www.who.int/publications/i/item/9789240015128*
  American College of Sports Medicine (ACSM)
  ACSM's Guidelines for Exercise Testing and Prescription (11th edition)
  https://www.acsm.org

Youth Exercise and Athlete Development Guidelines

- *International Olympic Committee (IOC)*
  IOC Consensus Statement on Youth Athletic Development
  https://bjsm.bmj.com/content/49/13/843

- *National Strength and Conditioning Association (NSCA) Position Statement on Youth Resistance Training https://www.nsca.com*
- *UK Chief Medical Officers*

HUAUOE013 - Advanced Pediatric Clinical Nutrition and Dietetics

1. GENERAL

SCHOOL	School of Health Science and Education, Harokopio University of Athens		
ACADEMIC UNIT	Department of Nutrition and Dietetics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE013	**SEMESTER**	3rd Semester of Full-Time (FT) 3rd Year of Part-Time (PT)
COURSE TITLE	Advanced Pediatric Clinical Nutrition and Dietetics		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	Specialization		
PREREQUISITE COURSES	No		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20% Synchronous teaching is delivered through an approved teleconference platform, while asynchronous learning is delivered through the university learning management system.		
AVAILABILITY TO ERASMUS STUDENTS	Yes.		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.* *Consult Appendix A* • *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area* • *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B* • *Brief Guide for drafting Learning Outcomes*
The aim of the course is to present the current approaches for personalized medical nutrition

therapy (MNT)/dietetic management of pediatric diseases, such as malnutrition, obesity, type 1 and 2 diabetes, dyslipidemia, gastrointestinal diseases (celiac disease, inflammatory bowel disease), allergies, renal disease, cancer, as well as the nutritional care in children with special needs, children with eating disorders, pediatric patients in ICU or undergoing surgery and for optimizing bone health.

Students are expected to develop the following:

Knowledge
• Understand the pathophysiology/metabolic implications of the aforementioned pediatric diseases/clinical conditions.
• Identify/understand the cutting-edge technologies, methods and tools for assessing the nutritional status and medical/dietetic care for the aforementioned pediatric diseases/clinical conditions.
• Identify/understand the current evidence-based recommendations for the aforementioned pediatric diseases/clinical conditions.

Skills
• Interpret scientific literature related to MNT of the aforementioned pediatric diseases/clinical conditions.
• Holistic assessment of nutritional status in children having the aforementioned pediatric diseases/clinical conditions.
• Design evidence-based, personalized nutrition care interventions and diet plans for the aforementioned pediatric diseases/clinical conditions.

Competences
• Integrate standardized/novel technologies, methods and tools in nutrition care of pediatric patients.
• Develop nutrition care programmes to support nutritional status and optimize growth in pediatric patients.
• Communicate scientific knowledge effectively in dietetic practice in the community and in clinical settings.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
……

Search, analysis and synthesis of data and information with the use of necessary technologies
Adaptability to new situations
Decision-making
Working independently
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism

Showing social, professional and ethical responsibility Criticism and self-criticism Production of creative and inductive thinking

3. COURSE SYLLABUS

This course introduces students to the concept of nutrition care process (NCP) for a wide range of pediatric diseases and medical conditions, including assessment/screening methods and the development of evidence-based and personalized medical nutrition therapy intervention based on dietetic interventions and counselling to optimize children's nutritional status and growth. This optional module is designed as an advanced continuation of the core module (UOEHUA002), focusing on more specialised clinical conditions and complex paediatric nutrition management approaches. Key topics include • Nutrition care process and nutrition counselling • Medical nutrition therapy of obesity, type 1 and 2 diabetes and dyslipidemia • Dietary management of malnutrition • Medical nutrition therapy and nutritional support in patients in ICU/surgery • Nutrition and bone health • Medical nutrition therapy of celiac disease • Medical nutrition therapy of inflammatory bowel disease • Medical nutrition therapy of allergies • Medical nutrition therapy of cancer • Medical nutrition therapy of renal disease • Medical Nutrition Therapy of children with special needs • Eating disorders

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous and asynchronous teaching.
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication with students is conducted through a combination of synchronous and asynchronous methods, supported by digital technologies and the university's online learning platform (Moodle). This includes weekly live (synchronous) sessions, scheduled virtual office hours, and regular interaction through course discussion forums and email communication. In addition, announcements and learning materials are consistently uploaded on the Moodle platform, ensuring continuous and structured communication throughout the course.
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	Student interaction is supported through: • group discussion during live sessions • collaborative assignments • online discussion forums • digital collaborative tools
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	ICT tools used in the course include: • Teleconference platform • Asynchronous learning platform • Collaborative digital tools • Online assessment systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	Students are required to have: • computer or tablet • reliable internet connection

	• webcam and microphone • access to university digital learning platforms
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.* *The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.*	**Activity** / **Semester workload (hours)** Lectures: 39 Study of lecture materials: 50 Essay writing: 40 Independent study: 71 **Course total: 200**
STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	**Description of the assessment method** Assessment of the course is designed to evaluate students' ability to critically analyse scientific evidence, apply theoretical knowledge and use standardized technologies, assessment tools, dietetic techniques and communication skills into dietetic practice. **Assessment methods include:** • applied nutrition care process plan for selected pediatric diseases (20% of final grade) • final quiz (80% of final grade) **Description of assessment tasks** <u>Applied nutrition care process plan</u> Students prepare a nutrition care process plan for selected pediatric diseases and pathological conditions. <u>Final quiz</u> At the end of the course, students complete a final quiz designed to assess their understanding of key concepts covered throughout the module. The quiz consists of multiple-choice questions and short open-ended responses, focusing on the application and interpretation of knowledge rather than simple recall. **Evaluation criteria** The following evaluation criteria will be applied: • critical analysis and evaluation of evidence • understanding pathophysiological and metabolic pathways and medical

	nutrition care processes in each of the selected pediatric diseases and pathological conditions ● application of knowledge to design of nutritional care process plans ● quality of nutritional care process plans and communication skills ● accuracy and completeness of responses to quiz questions. **Accessibility of evaluation criteria** Detailed assessment guidelines and submission instructions are made available to students through the course digital learning platform (Moodle) at the beginning of the semester.

5. RECOMMENDED BIBLIOGRAPHY

The following textbooks and guidelines provide an overview of the scientific principles and applied practices related to exercise, physical activity and health in children and adolescents. Additional scientific articles will be provided throughout the course.

- Clinical pediatric dietetics (5th Edition), Shaw V. ISBN: 978-1-119-46729-8. Oxford: Wiley-Blackwell, 2020
- Guidelines for Screening, Prevention, Diagnosis and Treatment of Dyslipidemia in Children and Adolescents, Stephen R. Daniels. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000–2020 Jan 18. https://pubmed.ncbi.nlm.nih.gov/27809440/

HUAUOE014 - Internet of Things (IoT): Technologies, Systems & Applications

1. GENERAL

SCHOOL	Digital Technology, Harokopio University		
ACADEMIC UNIT	Department of Informatics and Telematics		
LEVEL OF STUDIES	Postgraduate (Level 7 – MSc)		
COURSE CODE	HUAUOE014	**SEMESTER**	3rd Semester of Full-Time (FT) 3rd Year of Part-Time (PT)
COURSE TITLE	Internet of Things (IoT): Technologies, Systems & Applications		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and interactive seminars		Total: 39 FT: 3/week for 13 weeks PT: 4-5/month	7.5 ECTS
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	Special background / Specialisation		
PREREQUISITE COURSES	None (basic programming and networking knowledge recommended)		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%)* *synchronous distance learning (%)* *asynchronous distance learning (%)* *(In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	in-person (%): 0% synchronous distance learning (%): 80% asynchronous distance learning (%): 20%		
AVAILABILITY TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	HUA Digital Learning Platform (Moodle).		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

8. *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
9. *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
10. *Brief Guide for drafting Learning Outcomes*

The aim of this course is to provide students with a comprehensive understanding of IoT technologies and wearable devices as applied in child health and paediatric research. It bridges theoretical foundations with applied, data-driven thinking in clinical and public health contexts.

Students are expected to develop the following:

A. Knowledge

- Define key concepts of the Internet of Things (IoT), wearables, and digital health, and describe their applications in child health.
- Describe IoT system architecture (device–edge–cloud) and explain how data flows from sensors to cloud-based platforms.
- Explain the principles of operation of common sensors and wearable devices (e.g., accelerometers, heart rate monitors, sleep trackers).
- Compare wireless communication technologies (e.g., BLE, Wi-Fi, LPWAN) and understand their trade-offs in terms of energy consumption, range, and data transmission.
- Understand basic concepts of data transmission and IoT protocols (e.g., APIs, messaging concepts) and how data flows within IoT systems.
- Describe the role of cloud platforms and data pipelines, including real-time and batch data processing.
- Understand fundamental principles of time-series data analysis derived from wearable devices.
- Recognise key issues related to security, privacy, and ethics, particularly in paediatric populations (e.g., GDPR, informed consent, data protection).
- Describe emerging technologies (e.g., AIoT, digital twins) and their potential applications in personalised child health.

B. Skills

- Analyse and interpret wearable-derived data, identifying patterns in physical activity, sleep, and sedentary behaviour.
- Evaluate the quality and validity of data collected from children, comparing device-based and self-reported measurements.
- Apply basic data processing and visualisation techniques (e.g., preprocessing, simple analytics) to wearable datasets.
- Select appropriate communication technologies and system components based on technical and practical requirements (e.g., battery life, range, data needs).
- Map and describe IoT data flows (sensor → transmission → cloud → analysis).
- Design basic IoT system architectures for child health applications, including appropriate selection of sensors and infrastructure.
- Link IoT-derived data with health outcomes, such as physical activity levels, sleep patterns, and obesity-related indicators.
- Assess practical challenges and facilitators for implementing IoT solutions in real-world settings (schools, primary care, community).

C. Competences

- Integrate technological and clinical knowledge to design and evaluate IoT-based interventions in child health.
- Make informed decisions regarding technology selection, considering technical constraints, user needs and implementation context.
- Critically evaluate digital health solutions, identifying limitations, biases, and potential risks.
- Apply IoT solutions in real-world environments, including schools, primary care, and community settings.
- Address ethical and data protection challenges, particularly in paediatric populations.
- Collaborate effectively within interdisciplinary teams (e.g., healthcare professionals, engineers, researchers).

- Communicate technological concepts and data insights to non-technical stakeholders, supporting decision-making in clinical and public health contexts.

The learning outcomes correspond to Level 7 of the European Qualifications Framework (EQF).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology
Adaptability to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Other…
……

- Search, analysis and synthesis of data and information with the use of necessary technologies
- Adaptability to new situations
- Decision-making
- Working in an international environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Project planning and management
- Showing social, professional and ethical responsibility
- Respect for the natural environment and sustainability
- Criticism and self-criticism
- Production of creative and inductive thinking

3. COURSE SYLLABUS

This course introduces students to IoT technologies and wearable devices as applied in child health and paediatric research. It develops the conceptual, analytical, and applied skills needed to understand, evaluate, and utilise IoT systems in health-related contexts. The course spans 13 thematic lectures covering the following key topics:

Lecture 1: Introduction to IoT in Health

- What is IoT, wearables, digital health
- Examples in paediatric populations

Lecture 2: IoT Architecture & Ecosystems

- Device – Edge – Cloud
- IoT reference models
- How information flows through IoT systems

Lecture 3: Sensors & Physiological Data

- Accelerometers (physical activity)
- Heart rate sensors
- Sleep tracking
- Key concepts: sampling, accuracy vs precision, validity

Lecture 4: Data Quality & Measurement in Children

- Device vs questionnaire
- Bias & limitations
- Cut-offs for children (MVPA, sedentary)
- Link to child health research (e.g., childhood obesity)

Lecture 5: Communication Technologies

- BLE, Wi-Fi, LPWAN (LoRa/NB-IoT)
- Trade-offs: battery, range, data size
- Selecting the appropriate technology

Lecture 6: IoT Protocols & Data Flow

- How data is transmitted in IoT systems
- Key protocols and messaging concepts

Lecture 7: Cloud Platforms & Data Pipelines

- Storage & processing
- Real-time vs batch
- Dashboards
- Overview of major platforms (e.g., AWS/Azure)

Lecture 8: Data Analytics for Wearable Data

- Time-series data
- Basic preprocessing
- Simple analysis (activity patterns)
- Practical understanding, not heavy statistics

Lecture 9: Designing IoT Systems

- How to design a system
- Component selection
- Scalability & feasibility
- Applied examples

Lecture 10: Applications in Child Health Research

- Physical activity monitoring
- Sleep & behaviour
- Obesity & lifestyle interventions

Lecture 11: Implementation in Real Settings

- Schools
- Primary care
- Community interventions
- Facilitators and barriers to real-world use

Lecture 12: Security, Privacy & Ethics

- GDPR (children)
- Data protection
- Ethical challenges in paediatric digital health

Lecture 13: Emerging Trends & Future Directions

- AIoT
- Digital twins
- Personalised child health

4. TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING *Face-to-face, distance learning, etc.*	Distance learning using a combination of synchronous (live sessions) and asynchronous (pre-recorded lectures, online materials) teaching methods.

MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	Communication is conducted through: • Weekly live (synchronous) sessions via teleconference platform • Scheduled virtual office hours • Course discussion forums and email • Regular announcements and materials uploaded on the university LMS (Moodle)
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS *Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.*	• Group discussion during live sessions • Collaborative team assignments • Online discussion forums • Shared digital collaborative tools (e.g. GitHub, collaborative notebooks)
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, in laboratory training, in the communication with students*	• Teleconference platform (Microsoft Teams or equivalent) • Asynchronous learning platform (Moodle) • Online assessment and plagiarism detection systems
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	• Computer or laptop (min. 8 GB RAM recommended for lab exercises) • Reliable internet connection • Webcam and microphone • Access to university digital learning platforms • IoT hardware kit (Arduino/ESP32 — provided or purchased; details on course page)
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are checked using Turnitin or equivalent plagiarism detection software. Academic misconduct may lead to disciplinary procedures according to university regulations.
ARTIFICIAL INTELLIGENCE POLICY *(1) The use of Artificial Intelligence is prohibited in all circumstances* *(2) The use of Artificial Intelligence is allowed only with the permission of the instructor* *(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature* *(4) Students are free to use Artificial Intelligence*	The use of Artificial Intelligence tools is allowed only when clearly acknowledged and properly referenced. Students remain responsible for the originality and accuracy of their submitted work.
ORGANISATION OF TEACHING *The mode and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.*	

Activity	***Semester workload***
Lectures and seminars	39
Study of lecture materials	40
Laboratory / hands-on assignments	40
Individual project work	40
Essay / report writing	25
Independent study	16
Course total	***200 hours***

The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.	
STUDENT ASSESSMENT *Description of the assessment method* *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	**Description of the Assessment Method** Assessment is designed to evaluate students' ability to design IoT systems, apply technical knowledge, critically analyse trade-offs, and communicate solutions effectively. **Assessment Methods Include:** ● IoT system design project and presentation (60% of final grade) ● Hands-on lab assignments (20% of final grade) ● Final written exam or quiz (20% of final grade) **Description of Assessment Tasks** **IoT System Design Project and Presentation** Students design, prototype, and document an end-to-end IoT solution addressing a real-world use case (e.g. Smart City, Industrial IoT, Smart Home). The project includes a written technical report (~3,000 words) and a 15-minute recorded or live presentation. **Lab Assignments** A series of structured lab tasks covering hardware programming (Arduino/ESP32), protocol implementation (MQTT), and cloud connectivity, demonstrating practical IoT competence. **Final Exam / Quiz** A structured exam combining multiple-choice questions and short applied responses, covering all course modules. Focuses on understanding and application rather than simple recall. **<u>Evaluation Criteria</u>** ● Technical correctness and depth of system design ● Critical analysis of technology choices and trade-offs ● Integration of security, sustainability and ethical considerations ● Quality and completeness of documentation ● Clarity and effectiveness of presentation ● Accuracy and application in lab and exam tasks Detailed rubrics and assessment guidelines are provided via the course digital learning platform at the start of the semester.

5. RECOMMENDED BIBLIOGRAPHY

The following textbooks, reference works, and online resources provide foundational and advanced coverage of IoT technologies and systems. Additional scientific articles and technical documentation will be provided throughout the course.

Core Textbooks

- Buyya, R., & Dastjerdi, A. V. (Eds.) (2016). Internet of Things: Principles and Paradigms. Elsevier.
- Greengard, S. (2021). The Internet of Things. MIT Press Essential Knowledge Series.
- Pfister, C. (2011). Getting Started with the Internet of Things. O'Reilly Media.
- Guinard, D., & Trifa, V. (2016). Building the Web of Things. Manning Publications.
- Borgia, E. (2014). The Internet of Things vision: Key features, applications and open challenges. Computer Communications, 54, 1–31.

IoT Security

- OWASP IoT Project — IoT Top 10 Vulnerabilities: https://owasp.org/www-project-internet-of-things/
- ENISA (European Union Agency for Cybersecurity) — Good Practices for IoT Security: https://www.enisa.europa.eu

Cloud & Edge Platforms

- AWS IoT Core Documentation: https://docs.aws.amazon.com/iot/
- Microsoft Azure IoT Documentation: https://docs.microsoft.com/azure/iot-hub/
- Eclipse IoT Open-Source Projects: https://iot.eclipse.org

Standards & Interoperability

- oneM2M Standards: https://www.onem2m.org
- W3C Web of Things (WoT): https://www.w3.org/WoT/
- Connectivity Standards Alliance — Matter Protocol: https://csa-iot.org/all-solutions/matter/

Machine Learning & Analytics

- TensorFlow Lite / TinyML: https://www.tensorflow.org/lite
- Warden, P., & Situnayake, D. (2019). TinyML: Machine Learning with TensorFlow Lite on Arduino and Ultra-Low-Power Microcontrollers. O'Reilly Media.

Sustainability & Ethics

- European Commission — Green Digital Transition: https://digital-strategy.ec.europa.eu/en/policies/green-digital
- ITU-T Focus Group on Environmental Efficiency for Artificial Intelligence and other Emerging Technologies: https://www.itu.int

Dissertation Topics

Students will develop expertise applicable to Master's dissertation projects in areas including:

- IoT device development & prototyping (wearable sensors, smart home devices, portable systems)
- IoT data analytics (sensor data classification, anomaly detection, predictive analytics)
- IoT for Smart Cities (environmental monitoring, mobility, service delivery)
- Industrial IoT / Cyber-Physical Systems (machine monitoring, quality control, edge ML)
- IoT Security & Privacy (firmware security, secure communication, IoT device penetration testing)