

University of the Aegean

Dept of Food Science and Nutrition

Erasmus+ BIP: Transforming nutrition with artificial intelligence

Aim: The Blended Intensive Programme (BIP) “Transforming nutrition with artificial intelligence” is a 5-day interdisciplinary course designed to introduce students and early-career researchers from nutrition, dietetics, food science, and health-related disciplines to the practical applications of artificial intelligence (AI) in contemporary nutrition science, contributing to the digital transformation of health and nutrition education.

Overview: The BIP focuses on three interconnected domains: AI-enabled dietary assessment, personalised nutrition, and data-driven behaviour change strategies. Through a combination of lectures, guided practical sessions, and collaborative group work, participants will develop digital and data literacy skills, alongside critical thinking, problem-solving, and teamwork competences, by engaging with real-world applications of artificial intelligence in nutrition. Participants will explore how AI methods, including natural language processing, image-based analysis, and predictive modelling, can be used to improve the accuracy of dietary assessment, support tailored nutritional recommendations, and design effective interventions for promoting healthier eating behaviours.

Accessibility/ inclusivity: The course is specifically designed for participants with limited prior experience in programming or data analytics and supports diverse educational backgrounds, emphasising conceptual understanding, practical tool use, and critical evaluation. The BIP equips participants with the skills to engage with emerging digital tools and to critically apply AI in nutrition research and practice, while reflecting on ethical considerations, data quality, and real-world applicability.

Schedule

Before mobility (online component)

- Introductory materials
- Pre-reading + quiz assignment

During the mobility

Day 1: Foundations of dietary assessment and role of AI	
Time	Description
09.00-10.30	<i>Session 1</i> • Programme introduction, learning objectives, BIP structure

	Overview of dietary assessment methods (24h recalls, FFQs, food diaries, biomarkers – strengths & limitations)
10.30-10.45	Coffee break
10.45-12.15	<i>Session 2</i> - Measurement error, bias, and misreporting - Challenges in accurately measuring dietary intake
12.15-13.15	Lunch break
13.15-14.45	<i>Session 3</i> - Introduction to AI concepts for non-specialists - Mapping AI methods to dietary assessment challenges - Case studies: where AI improves dietary assessment (real-world examples)
14.45-15.00	Coffee break
15.00-17.00	<i>Session 4</i> Introduction to programming with Python
Day 2: AI tools for dietary assessment	
Time	Description
09.00-10.30	<i>Session 1</i> Image-based dietary assessment (e.g., food recognition, segmentation, portion estimation)
10.30-10.45	Coffee break
10.45-12.15	<i>Session 2</i> NLP & LLM-based dietary assessment (e.g., food diary parsing, recipe analysis, text-to-nutrient pipelines)
12.15-13.15	Lunch break
13.15-14.45	<i>Session 3</i> - Sensor-based & wearable approaches (e.g., passive intake detection, eating episodes, limitations) - Comparison of methods: validity, feasibility, scalability
14.45-15.00	Coffee break
15.00-17.00	<i>Session 4</i>

	• Introduction to group project themes (e.g., improving accuracy, reducing bias, designing AI-assisted tools) ○ Formation of international interdisciplinary groups ○ Initial project scoping and mentoring • Kickoff of group projects (hands-on)
Day 3: Hands-on applications: from data to dietary intake	
Time	Description
09.00-10.00	<i>Session 1</i> • Hands-on: text-based dietary assessment using LLMs
10.00-11.00	<i>Session 2</i> Hands-on: image-based analysis workflows (annotation → classification → estimation)
11.00-11.15	Coffee Break
11.15-12.15	<i>Session 3</i> • Hands-on: integrating multiple data sources (text + image + context)
12.15-13.15	Lunch break
13.15-14.45	<i>Session 4</i> • Introduction to simple ML approaches for estimating intake, handling missing data, identifying misreporting • Strengths and limitations of automated pipelines
14.45-15.00	Coffee break
15.00-17.00	<i>Session 5</i> • Guided group project development
Day 4: From dietary assessment to decision making	
Time	Description
09.00-10.30	<i>Session 1</i> • Translating dietary data into: diet quality indices, nutrient adequacy, food environment metrics • AI-supported interpretation of dietary data
10.30-11.15	<i>Session 2</i> • Part 1: Personalised nutrition
11.15-11.30	Coffee break

11.30-12.15	<i>Session 2</i> Part 2: Behaviour change and nudge strategies
12.15-13.15	Lunch break
13.15-14.45	<i>Session 3</i> - Ethics, bias, transparency, and GDPR in dietary data & AI - Critical appraisal of AI-based dietary assessment tools
14.45-15.00	Coffee break
15.00-17.00	<i>Session 4</i> Advanced project work with structured feedback
Day 5: Integration, presentations and future directions	
Time	Description
09.00-10.30	<i>Session 1</i> Future directions in dietary assessment (e.g., passive monitoring, multimodal AI, real-time feedback)
10.30-10.45	Coffee break
10.45-12.45	<i>Session 2</i> - Final group project presentations - Discussion and peer feedback
12.45-13.45	Lunch break
13.45-15.15	<i>Session 3</i> - Individual reflection - Group discussion (what worked well/ limitations) - Real-world implementation
15.15-15.30	Coffee break
15.30-16.30	<i>Session 4</i> - Programme evaluation - Closing remarks

After mobility (online component)

- Post-evaluation quiz