MIDDLE WEST UNIVERSITY LLC · APPLETON, WISCONSIN, USA

Curriculum and Syllabus

MSc — Master of Science in Health Economics and Data Analytics

Degree awarded	Master of Science (MSc)
Program length	4 semesters
Credits	120 ECTS-equivalent credits
Language	English
Mode of study	Fully online, asynchronous study with scheduled tutorial consultations and analytics labs
Document	Full course-by-course syllabus

WHAT THIS DOCUMENT CONTAINS

- Every semester with its credit load and thematic focus
- Course-by-course syllabus with code, credits and workload hours
- Course summaries and the learning outcomes of each module
- The assessment formula applied to each individual course
- Credit distribution table across the whole degree

A quantitative master's degree for professionals who must justify health care decisions with evidence, data and economic reasoning.

Credit distribution

Semester	Thematic focus	Credits
Semester 1 — Economic and statistical foundations	The analytical toolkit	30
Semester 2 — Evaluation methods	Measuring value and outcome	30
Semester 3 — Applied analytics	From analysis to decision	30
Semester 4 — Master's dissertation	Independent quantitative research	30
Total		120

Semester 1 — Economic and statistical foundations

The analytical toolkit · 30 credits

MSC-101 — Health Economics

10 credits · 250 hours total workload

Demand and supply for health services, insurance and moral hazard, provider payment systems, market failure and the economics of regulation.

Course learning outcomes

- Explain why health care markets deviate from competitive assumptions
- Compare fee-for-service, capitation and DRG payment and their incentive effects
- Assess the welfare consequences of a proposed reimbursement change

Assessment: Policy analysis paper (60%) and examination (40%)

MSC-102 — Applied Statistics and Regression

10 credits · 250 hours total workload

Estimation and inference, linear and logistic regression, model diagnostics, confounding and the interpretation of effect sizes.

Course learning outcomes

- Specify and estimate a regression model appropriate to a research question
- Diagnose violations of model assumptions and respond to them
- Report results with confidence intervals and honest interpretation

Assessment: Three analytical problem sets (50%) and examination (50%)

MSC-103 — Health Data Management and Governance

10 credits · 250 hours total workload

Data structures in claims, EHR and registry systems, linkage and de-identification, quality assessment, and the HIPAA and GDPR constraints on analytical work.

Course learning outcomes

- Assess the fitness for purpose of an administrative dataset

- Design a de-identification and access plan for a secondary-use project
- Document a reproducible data-preparation pipeline

Assessment: Data governance dossier (100%)

Semester 2 — Evaluation methods

Measuring value and outcome · 30 credits

MSC-201 — Economic Evaluation and Cost-Effectiveness Modelling

12 credits · 300 hours total workload

Cost-minimisation, cost-effectiveness, cost-utility and cost-benefit analysis; decision trees, Markov models, discounting and probabilistic sensitivity analysis.

Course learning outcomes

- Construct a Markov cost-utility model from published inputs
- Run and present a probabilistic sensitivity analysis
- Judge whether an evaluation supports its stated conclusion

Assessment: Full model with technical report (70%) and defence (30%)

MSC-202 — Outcomes Research and Quality Measurement

9 credits · 225 hours total workload

Clinical and patient-reported outcome measures, risk adjustment, case-mix, indicator design and the pitfalls of public performance reporting.

Course learning outcomes

- Select and justify outcome measures for a defined service line
- Apply risk adjustment and explain its limits
- Design an indicator set that resists gaming

Assessment: Indicator framework (60%) and critique paper (40%)

MSC-203 — Causal Inference with Observational Data

9 credits · 225 hours total workload

Matching, difference-in-differences, instrumental variables and interrupted time series applied to policy and programme evaluation.

Course learning outcomes

- Choose an identification strategy suited to the available data
- Implement a difference-in-differences analysis and test its assumptions
- State the causal claim a design does and does not support

Assessment: Empirical replication project (100%)

Semester 3 — Applied analytics

From analysis to decision · 30 credits

MSC-301 — Predictive Modelling in Health Care

10 credits · 250 hours total workload

Prediction versus explanation, validation and calibration, class imbalance, fairness auditing and the governance of algorithmic tools in clinical settings.

Course learning outcomes

- Develop and validate a risk-prediction model
- Audit a model for calibration drift and subgroup performance
- Document a model card suitable for a governance committee

Assessment: Model build with validation report (100%)

MSC-302 — Pricing, Reimbursement and Market Access

10 credits · 250 hours total workload

Value-based pricing, HTA submissions, managed-entry agreements and negotiation with payers in the United States and Europe.

Course learning outcomes

- Assemble the economic core of an HTA submission
- Design a managed-entry agreement addressing payer uncertainty
- Anticipate the objections a reimbursement committee will raise

Assessment: Submission dossier (70%) and negotiation simulation (30%)

MSC-303 — Research Design and Dissertation Preparation

10 credits · 250 hours total workload

Question formulation, protocol writing, feasibility assessment, ethics review and pre-registration of the master's research project.

Course learning outcomes

- Write a complete, feasible research protocol
- Justify sample, method and analysis plan in advance
- Pass internal ethics and data-access review

Assessment: Approved protocol (100%)

Semester 4 — Master's dissertation

Independent quantitative research · 30 credits

MSC-401 — Master's Dissertation and Defence

30 credits · 750 hours total workload

An independent 15,000–18,000 word empirical study with reproducible analysis code, supervised by a member of faculty.

Course learning outcomes

- Execute a pre-registered analysis and report deviations transparently
- Deliver a reproducible analysis package alongside the written work
- Defend method and interpretation before an examination panel

Assessment: Dissertation (80%) and oral defence (20%)