Measurement and Evaluation Application Examples from Around the World

A) Engineering Departments

UNDERGRADUATE LEVEL

USA – MIT / Stanford / UC Berkeley

- Automatic Code Evaluation (Autograder): Test scenarios connected with unit tests, instant feedback, rubrics + version control (GitHub Classroom) .
- Capstone Projects: Real company/research problems, Search report + demo + final delivery triple, peer evaluation + customer score.
- Lab Practices: Pre-lab quiz, lab notebook, video-recorded display and rubric performance scoring.

Sources : MIT OpenCourseWare – Assessment in Engineering Education
https://ocw.mit.edu
https://engineering.berkeley.edu/
https://cs61a.org/
https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/

United Kingdom – Imperial College London / UCL

- CDIO based (Conceive–Design–Implement–Operate) set projects, design journal, design review sessions, poster + oral defense.
- Open-ended problem clusters andstructural with rubrics formative feedback.

Sources : CDIO Official site http://www.cdio.org/
https://en.wikipedia.org/wiki/CDIO_Initiative
https://www.imperial.ac.uk/electrical-engineering/study/current-students-course-handbook/msc-individual-research-project/

Germany – Technical University of Munich (TUM) / RWTH Aachen University

- Model-based design And HIL (Hardware-in-the-Loop) evaluation, Two rater application for reliability.
- Case study + short report (short memorandum) in engineering economics courses .

Sources: TUM Engineering Education Research ➜ https://www.ed.tum.de/en/cer/
https://www.mathworks.com/company/user_stories/technische-universitat-munich-uses-model-based-design-to-drive-research-problem-based-learning-and-industry-collaboration.html
https://www.cee.ed.tum.de/en/era/software/reliability/
https://studylib.net/doc/25895679/case-studies-in-engineering-economics-for-manufacturing-c
https://www.rwth-aachen.de/cms/root/studium/vor-dem-studium/studiengaenge/liste-aktuelle-studiengaenge/studiengangbeschreibung/~bjsi/wirtschaftsingenieurwesen-b-sc-

fachric/?lidx=1

Singapore – NUS (National University of Singapore)

- Online exam surveillance + randomize question banks, gradual clue giving quizzes.
- peer code review, rubric + inline comment.

Sources: NUS Teaching Innovation: https://ctlt.nus.edu.sg/teaching-and-learning-quality/online-peer-review-system/
https://blog.nus.edu.sg/teachingconnections/2020/10/07/e-proctoring-a-generally-fuss-free-cost-free-method/
https://www.straitstimes.com/singapore/education/coronavirus-nus-students-get-zero-marks-for-cheating-on-take-home-exam
https://www.youtube.com/watch?pp=0gcJCdgAo7VqN5tD&v=jYWgH2s5l70
https://blog.nus.edu.sg/cdtkdr/2014/03/03/peer-feedback/

Canada – University of Toronto / University of British Columbia (UBC)

- Design-based communication: technical report writing, rubric language-content separate scoring.
- Multiple attempt (multiple-attempt) quiz, from error learning focused.

Sources: University of Toronto – Center for Teaching Support & Innovation
https://teaching.utoronto.ca/
UBC: Giving Extra Attempts/Time to Canvas Quizzes
https://teachingsupport.forestry.ubc.ca/files/2020/10/Tips-for-Giving-Extra-Attempts-and-Time-in-Canvas-Quizzes-updated.pdf
UBC: Assessment Rubrics – CPSC 436I (2020S)
https://blogs.ubc.ca/cpsc436i2020s/assessment-rubrics/
Alternatif kaynak (örnek uygulama): Webwork ile Proctorio kullanarak sınav hazırlama
https://shfahimi.net/2020/12/24/exams-with-proctorio-webwork/

Türkiye – ODTÜ / İTÜ

- Automatic test + manual rubric hybrid evaluation.
- Workshop/OSCE similar APPLICATION exams (circuit building, CNC, etc.) for control lists.

Sources :
https://catalog.metu.edu.tr/course.php?prog=201&course_code=0910435
https://ceng.metu.edu.tr/en/courses
https://ninova.itu.edu.tr/
https://eee.metu.edu.tr/en/labs
https://www.makina.itu.edu.tr/

GRADUATE LEVEL

- **Research Methods:** Pre-registration, replication assignment, research journals, method critique with rubric.

  Sources :
  OSF – Preregistration Guide: https://www.cos.io/blog/choosing-preregistration-template-guide-for-researchers
  Wikipedia – Preregistration (Science):
  https://en.wikipedia.org/wiki/Preregistration_%28science%29

- **Article Workshop:** Double-blind peer review, structural rubric (originality, method, spelling).

  Source : COS – Open Science Framework: https://www.cos.io/initiatives/prereg

- **ELN (Electronic Lab Notebook):** Time-stamped tracking of experiment records, cross-checking for improved reliability.

  Sources :
  Nature Protocols – Electronic Lab Notebooks:
  https://www.nature.com/articles/s41596-021-00645-8
  Springer – ELN in Laboratory Education:
  https://link.springer.com/article/10.1007/s44217-024-00161-3

- Oral Defense + Portfolio: Research file, video presentation, jury score with rubric.

  Sources: Graduate School Guidelines (Portfolio + oral exam practices in many universities' graduate handbooks)
  https://marc.english.txst.edu/current-students/portfolio-guidelines.html
  https://cehd.gmu.edu/assets/docs/forms/PhD%20Program/PortfolioGuidelines.docx
  https://miamioh.edu/cec/graduate-programs/cse-grad-handbook/cse-grad-appendix-c.html

B) Agriculture Departments
C)

UNDERGRADUATE LEVEL

- **Netherlands – Wageningen University & Research**

- Field trial planning-implementation-report field stage, field notebook + GIS mapping, rubric field skill.
- Food chain case analysis, short policy note.

Sources: WUR Assessment in Life Sciences https://www.wur.nl/en/education- programmes
https://www.wur.nl/en/education-programmes/master/msc-programmes/msc-thesis-msc-internship-and-msc-research-practice.htm
https://www.wur.nl/en/research-results/research-institutes/environmental-research/facilities-tools/maps-and-gis-files.htm
https://www.wur.nl/en/research-results/chair-groups/social-sciences/business-management-organisation/education/education-documents.htm

USA – UC Davis / Iowa State / Nebraska–Lincoln

- Soil and plant analyses: safety + technical checklist for wet chemistry laboratories, pre-lab quiz.
- Flight-based viewing (drone): NDVI mapping homework, QGIS output + short comment rubric.

- Farm management simulation: Seasonal decisions, profitability-risk scores, group internal contribution peer score.

Sources: UC Davis Agricultural Experiment Station https://caes.ucdavis.edu/
https://digitalag.ucdavis.edu/decision-support-tools
https://video.ucdavis.edu/media/Digitizing%2BAgriculture%3A%2BDrone-based%2BPlant%2BMonitoring/1_f7km1jcu
https://www.ucdavis.edu/news/researchers-create-app-drones-improve-farm-efficiency
https://www.extension.iastate.edu/ag/farm-business-management
https://transforminghigher.education/Case-Study-of-Student-Managed-Farm-at-Iowa-State-University.pdf

Australia – University of Queensland (UQ)

- Livestock farming behaviour observation: Ethogram with data collection, data verification + short report.

Sources : UQ School Agriculture https://qaafi.uq.edu.au/
https://agriculture-food-sustainability.uq.edu.au/
https://programs-courses.uq.edu.au/course.html?course_code=anim1014
https://programs-courses.uq.edu.au/course.html?course_code=ANIM3005

United Kingdom - University of Reading

- Plant pathology: OSPE/OSCE similar microscopy stations, time-limited diagnosis + short explanation.

Sources : University of Reading Agriculture Teaching https://www.reading.ac.uk/
University of Reading – School of Agriculture, Policy & Development (general academic unit page): https://www.reading.ac.uk/apd/
Plant Pathology Laboratory – Analytical and Research Laboratories:
https://www.reading.ac.uk/apd/facilities/research-labs

Turkey – Ege University / Ankara University / Çukurova University

- Field internship diary: weekly target-evidence, consultant-farmer feedback.

Soil pH and salinity measurement: reflection note on sampling error.

Sources: YÖK Course Information Packages (TR Universities) https://yokatlas.yok.gov.tr/
https://megep.meb.gov.tr/mte_program_modul/moduller/Toprak.pdf
https://ects.ogu.edu.tr/dosyalar/48-Tar%C4%B1msal%20Biyoteknoloji%20B%C3%B6l%C3%BCm%C3%BC/Ders%20Bilgi%20Paketi.docx?t=20240227214438
https://yesil.istanbul/Content/publications/17.pdf
https://bozok.edu.tr/Dosya/e0875e18-6.pdf

GRADUATE LEVEL

❖ Experimental Design and Statistics

Factorial trial plan; analysis reproduction with R/Julia; output file + abbreviated report

Penn State — STAT 503: Design of Experiments (course home page)
https://online.stat.psu.edu/statprogram/stat503

Penn State — STAT 503: 2^k and fractional factorial designs (course units)
https://online.stat.psu.edu/stat503/les s on/7/7.2
https://online.stat.psu.edu/stat5 0 3/lesson/8/8.2
https://online.stat.psu.edu/stat 5 03/lesson/6/6.3

UBC — STAT 545: Reproducible data analysis in R (homework/flow)
https://stat545.stat.ubc.ca/
https://stat545.stat.ubc.ca/assignments/

MIT — 18.S191 (Reproducible assignments with Julia & Pluto)
https://ocw.mit.edu/courses/18-s191-introduction-to-computational-thinking-fall-2020/pages/course-materials/
https://computationalthinking.mit.edu/Fall20/installation/

UF/IFAS — AGR 5266C Field Plot Techniques (graduate; design of experiments & R)

https://agronomy.ifas.ufl.edu/media/agronomyifasufledu/documents/AGR5266C_0877_Fall2025.pdf
https://agronomy.ifas.ufl.edu/media/agronomyifasufledu/documents/AGR5266C_0877_Fall2023.pdf

- **Applied Ecology / Agro-ecology**

Long-term data set analysis, interim findings poster session, and peer questions are scored.

University of Minnesota — Cedar Creek LTER Data Catalog (uzun dönem ekolojik veri)
https://cedarcreek.umn.edu/research/data

UC Santa Barbara — SBC LTER Data portal & catalog
https://sbclter.msi.ucsb.edu/data/
https://sbclter.msi.ucsb.edu/data/catalog/

Ohio State CFAES — Poster Guidelines
https://research.cfaes.ohio-state.edu/poster-competition/poster-guidelines

Clemson CAFLS Graduate Symposium — Poster Rubric
https://www.clemson.edu/cafls/graduate-symposium/presenter-information/poster-rubric.html

AAAS Student E-Poster Contest — MS/PhD inclusive rules
https://meetings.aaas.org/wp-content/uploads/E-Posters-2025-Student-Poster-Guidelines.pdf

- **Specialty Exam — OSPE/OSCE**

OSPE: botany/soil (laboratory-practical) , OSCE: animal health (clinical)
Rubric + two assessors

University of Edinburgh — OSCE station design & marking notes
https://edwebcontent.ed.ac.uk/sites/default/files/atoms/files/thurs_am_short_guide_to_the_osce_and_creating_the_station_mark_sheet_notes_handout.pdf

University of Edinburgh — OSCE guide (sample/processed station document)
https://edwebcontent.ed.ac.uk/sites/default/files/atoms/files/thurs_am_osce_guidance_and_worked_example_for_station_authors_with_guide_on_candidate_instructions_essce.pdf

University of Aberdeen — Use of OSPE in science
https://edwebcontent.ed.ac.uk/sites/default/files/atoms/files/bmsforum19_p1_derekscott.pdf
https://aura.abdn.ac.uk/bitstream/2164/11611/1/5.7_derek_scott.pdf

RCVS — Veterinary Nurse Education Standards (curriculum & assessment framework)
https://www.rcvs.org.uk/setting-standards/accrediting-primary-qualifications/accrediting-veterinary-nursing-qualifications/rcvs-standards-framework-for-veterinary-nurse-education-and/standard-5-curricula-and-assessment/
https://www.rcvs.org.uk/news-and-views/publications/vn-standards-framework/rcvs-standards-framework-for-veterinary-nurse-education-and-training-march-2025.pdf

RCVS — Statutory Membership Exam Guidance 2025 (Independent evaluators at OSCE stations)
https://www.rcvs.org.uk/document-library/2025-statutory-membership-exam-sme-guidance/