About Fab Learning Academy

Fab Learning Academy (FLA) is an international professional development and educator certification program focused on digital fabrication technologies, innovative classroom practices, and the science of learning. The program is collaboratively delivered through a global partnership that includes eduFAB (United States), the University of Oulu (Finland), Fab Lab Barcelona (Spain), Singapore Polytechnic (Singapore), and Fab Lab Armenia (Armenia).

Participants engage in approximately 108–120 hours of professional learning through global masterclasses, local technical instruction, hands-on technical projects, classroom-based Field Activities, reflective documentation, presentations from practitioners in education, technology, and design, and a culminating presentation. Throughout the program, educators develop both technical skills and instructional strategies related to digital fabrication, electronics, programming, physical computing, sustainability, and maker-centered learning.

Fab Learning Academy Distributed Learning Model

Fab Learning Academy utilizes a distributed educational model that combines global expertise with local support and classroom application. Participants learn from an international faculty through synchronous virtual masterclasses while also receiving hands-on technical instruction and mentoring through a local Fab Lab or Learning Node. This structure allows educators to engage with a global community of practice while receiving contextualized support in their local setting.

A defining feature of the program is the completion of a series of Field Activities in which participants design, build, and implement authentic learning experiences with their own learners. These activities require educators to develop classroom resources, create standards-aligned lesson plans, integrate digital fabrication technologies into instruction, collect evidence of student learning, and reflect on their practice. This cycle of design, implementation, feedback, and reflection ensures that learning is immediately transferred into classroom practice and results in a portfolio of tested educational projects.

Program Schedule and Learning Activities

The schedule below illustrates the distributed learning model used throughout Fab Learning Academy. Each week includes a combination of global masterclasses led by international faculty, local technical instruction and mentoring, and applied assignments designed to connect new learning directly to classroom practice. Together, these experiences support the development of both technical skills and innovative teaching strategies.

Module 1: Foundations of Maker-Centered Learning and Digital Fabrication			
Week	**Global Masterclass (1.5 hours)**	**Local Node (1-2 hours)**	**Assignment (2-4 hours)**
M1.W1	Introduction to Fab Learning Academy; maker-centered learning; digital fabrication in education; learning goals and documentation practices; participant discussions on educational contexts and challenges	Orientation to the local learning node, Fab Lab environment, equipment, workflows, and safety practices	Establish a Learning Diary and documentation portfolio. Complete introductory reflections and identify a classroom challenge or instructional opportunity that may be addressed through maker-centered learning.
M1.W2	Design processes for learning; digital fabrication continuum; developing learning objectives; connecting technology to curriculum; discussion of classroom applications	Introduction to 2D design software and vinyl cutting workflows; guided hands-on fabrication activities	Complete introductory design exercises and create a simple fabricated artifact. Document the design process and reflect on potential classroom applications.
M1.W3	Constructionism and learning theory; social-emotional learning in maker-centered environments; reflective teaching practices; lesson design discussions	Introduction to laser cutting workflows and educational applications; hands-on fabrication practice and project development	Design and fabricate a classroom teaching aid or instructional resource. Develop a draft lesson plan that incorporates the fabricated artifact to support student learning.
M1.W4	Field Activity Assigned & Real World Talks: Field activity overview, implementation expectations, rubric review, peer discussion and planning; presentations from educators and innovators demonstrating creative approaches to maker-centered learning and classroom engagement.	Coaching and support from local instructors and peers.	Develop a standards-aligned lesson plan and create a fabricated teaching aid, model, manipulative, or instructional artifact that supports student learning in your educational setting.
M1.W5	Field Activity Open Lab: Small-group discussions, implementation support, individualized feedback, and Q&A with global instructors.	Coaching and support from local instructors and peers.	Complete and document the teaching aid, model, manipulative, or instructional artifact, finalize the accompanying lesson plan, and submit a reflective Learning Diary entry describing the design process, educational purpose, and potential classroom implementation.

Module 2: Project-Based Learning, Electronics, Design, and Programming

Week	Global Masterclass (1.5 hours)	Local Node (1-2 hours)	Assignment (2-4 hours)
M2.W1	Project- and design-based learning; digital fabrication with learners; fundamentals of electronics for education; introduction to Module 2 Field Activity; discussion of opportunities and challenges of using electronics in educational settings	Exploration of simple circuits, electronic components, simulators, and classroom applications of electronics	Design and simulate a simple electronic circuit, build introductory circuits using physical materials, experiment with a Makey Makey (or similar interface), and document classroom applications and reflections in the Learning Diary.
M2.W2	Curriculum and standards alignment; educational portfolios; introductory CAD concepts; designing three-dimensional projects with laser cutting; integrating digital fabrication into curriculum	Laser cutting workflows, construction techniques, joints and hinges, and fabrication of three-dimensional objects	Create a laser-cut construction kit or three-dimensional object, explore methods for connecting fabricated components, and document educational applications, curriculum connections, and reflections in the Learning Diary.
M2.W3	Universal Design for Learning; inclusive and culturally responsive teaching; maker mindset; student technological fluency; programming in educational environments; discussion of diversity and accessibility in maker-centered learning	Introduction to block-based programming environments and foundational programming concepts including variables, conditions, loops, and functions	Complete programming tutorials, develop an interactive story, game, or quiz using block-based programming, document the design process and code, and reflect on programming, inclusion, and student learning in the Learning Diary.
M2.W4	Field Activity Assigned: Electronics and programming integration in educational settings; field activity overview; implementation expectations; rubric review; peer discussion and planning	Coaching and support from local instructors and peers	Develop or adapt a standards-aligned lesson plan that integrates electronics and/or programming to support student learning.
M2.W5	Real World Talks: Presentations from educators, designers, and innovators demonstrating applications of digital fabrication, programming, assistive technologies, and AI-supported design	Coaching and support from local instructors and peers	Continue development of the Field Activity lesson plan and prepare for classroom implementation.
M2.W6	Field Activity Open Lab: Small-group discussions, implementation support, individualized feedback, and Q&A with global instructors	Coaching and support from local instructors and peers	Implement the Field Activity with learners, collect evidence of student learning, and submit a reflective Learning Diary entry analyzing instructional effectiveness, student outcomes, and opportunities for improvement.

Module 3: Assessment, 3D Printing, Sustainability, and Biomaterials

Week	Global Masterclass (1.5 hours)	Local Node (1-2 hours)	Assignment (2-4 hours)
M3.W1	Distributed TPACK; assessment in maker-centered learning; additive manufacturing and 3D printing; aligning learning outcomes and assessment; discussion of educational applications of 3D printing	Introduction to 3D printers, slicer software, printer operation, and additive manufacturing workflows	Design, slice, and fabricate a 3D-printed object that supports teaching and learning. Document the design process, classroom applications, and reflections in the Learning Diary.
M3.W2	Sustainability, circularity, and biomaterials; culturally reflective teaching; sustainable practices in makerspaces; educational applications of sustainable design	Creation and testing of biomaterials; mold design and fabrication; experimentation with sustainable materials and fabrication processes	Design and fabricate a mold, create and test a biomaterial, and reflect on opportunities to integrate sustainability concepts into teaching and learning.
M3.W3	Field Activity Assigned: assessment design, project planning, sustainability-focused learning experiences, detailed field activity expectations, rubric review, and small-group discussions	Coaching and support from local instructors and peers	Develop or adapt a standards-aligned lesson plan that incorporates digital fabrication and addresses a sustainability-related challenge or Sustainable Development Goal (SDG), including an assessment strategy aligned to the learning objectives.
M3.W4	Real World Talks: presentations from educators, researchers, and practitioners demonstrating innovative applications of digital fabrication, sustainability, and maker-centered learning	Coaching and support from local instructors and peers	Continue development of the Field Activity lesson plan and prepare for classroom implementation.
M3.W5	Field Activity Open Lab: small-group discussions, individualized feedback, implementation support, and Q&A with global instructors	Coaching and support from local instructors and peers	Implement the Field Activity with learners, collect evidence of student learning, and submit a reflective Learning Diary entry analyzing instructional effectiveness, student outcomes, and opportunities for improvement.

Module 4: Physical Computing, Makerspace Leadership, and Interdisciplinary Learning

Week	Global Masterclass (1.5 hours)	Local Node (1-2 hours)	Assignment (2-4 hours)
M4.W1	Building maker-centered learning communities; content integration and multidisciplinarity; makerspaces in educational environments; computational and systems thinking; introduction to physical computing; field activity overview and planning discussions	Introduction to physical computing platforms, development environments, sensors, actuators, and classroom applications	Explore physical computing resources and tutorials, set up a development environment, experiment with sensing and actuating using a development board, and document potential classroom applications in the Learning Diary.
M4.W2	Managing makerspaces; infrastructure and operations; community partnerships; Internet of Things (IoT) and connectivity; collaboration and leadership in maker-centered learning environments	Exploration of connected devices, communication between development boards, and IoT applications in educational settings	Develop and test a physical computing or IoT project that collects, transmits, or responds to data. Reflect on opportunities for community engagement, interdisciplinary learning, and future makerspace development.
M4.W3	Field Activity Assigned: Multidisciplinary curriculum design; assessment across disciplines; physical computing integration; field activity expectations, rubric review, and peer planning discussions	Coaching and support from local instructors and peers	Develop an original standards-aligned lesson plan that integrates two or more disciplines and incorporates physical computing concepts such as microcontrollers, sensors, actuators, or electronic circuits. Design assessments that align with learning objectives across all included disciplines.
M4.W4	Real World Talks: Presentations from educators, researchers, and practitioners demonstrating innovative applications of makerspaces, interdisciplinary learning, physical computing, and educational innovation	Coaching and support from local instructors and peers	Continue development of the Field Activity lesson plan and prepare for classroom implementation.
M4.W5	Field Activity Open Lab: Small-group discussions, implementation support, individualized feedback, and Q&A with global instructors	Coaching and support from local instructors and peers	Implement the Field Activity with learners, collect evidence of student learning, and submit a reflective Learning Diary entry analyzing interdisciplinary learning outcomes, instructional effectiveness, and opportunities for future growth.

Culminating Presentation and Portfolio Development			
Week	**Global Masterclass (1.5 hours)**	**Local Node (1-2 hours)**	**Assignment (1-2 hours)**
F.W1	Presentation Preparation Open Lab: Small-group discussions, individualized feedback, presentation coaching, and Q&A with global evaluators. Participants may seek support for presentation development, field activity documentation, or completion of outstanding program requirements.	Coaching and support from local instructors and peers.	Select one completed Field Activity to feature in the final presentation. Organize supporting artifacts, documentation, student work samples (if applicable), and presentation materials.
F.W2	No Global Masterclass Scheduled	Optional local support and peer collaboration.	Continue preparation of the final presentation, refine documentation, and complete any remaining program requirements or portfolio components.
F.W3	Final Presentations: Participants present a selected Field Activity, highlighting the learning goals, fabrication or technology integration, implementation process, outcomes, reflections, and lessons learned. Presentations include peer feedback and celebration of learning.	Celebration and reflection with local instructors and peers.	Deliver a 3–5 minute presentation showcasing one completed Field Activity and submit any final documentation required for program completion.

Distribution of hours

This is the estimated distribution of hours per module

	Masterclass	Local Node tutoring	Personal Assignment	Field Activity
Module 1	7.5	6-10	8 - 16	8 -12
Module 2	9	9-12	8 - 12	10 - 14
Module 3	7.5	6-10	5 - 8	10 - 14
Module 4	7.5	6-10	5 - 8	14 -18
Final presentation	3	4-6	3 - 6	
	34.5	31 - 48	29 - 50	42 - 58

TOTAL = 136 - 190 hours -> 5 - 7 ECTS