Decision-Making for Program Modes of Learning

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Preamble

With most of course directors and student now having had experience of virtual teaching and learning, the possibilities of providing diverse modes of learning in a coordinated and strategic fashion across a program is an extension of this trend. This guide provides a decision-making process for choosing modes of learning at a program level.

The needs of the course, students and course directors are key to selecting educational approaches and enabling technologies. In different units and disciplines, there may be good reasons for integrating a *custom mix* of learning modes, which will require program-level coordination along with empowering course directors and supporting their efforts. The process articulated below considers how to develop an appropriate *mix* of learning modes based on the context of a program.

Who is this guide for? Program administrators guiding program-level discussions, Faculty Dean's Offices, curriculum support staff, and curriculum committees

What is the purpose of the guide? To assist programs seeking a coherent and reasoned approach to the exploration of learning modes based on the identity of the program, its various stakeholders, and the student experience it seeks to deliver

What does the guide NOT cover? Learning modes are explored from a pedagogical perspective while laying out operational considerations at a high-level. This guide is intended to be used as a tool to assist programs exploring various learning modes; however, programs must be aware of and consider their specific contexts to situate their ideas. Faculty Dean's Offices have rules and regulations governing the decision-making process for learning modes. The intersection of applicable collective agreements, registrarial processes, and York University Quality Assurance Procedures (YUQAP) must be accounted for. Individual Faculties are encouraged to adapt this guide to their specific circumstances, if desired.

Overview of the Decision-Making for Program Modes of Learning Process

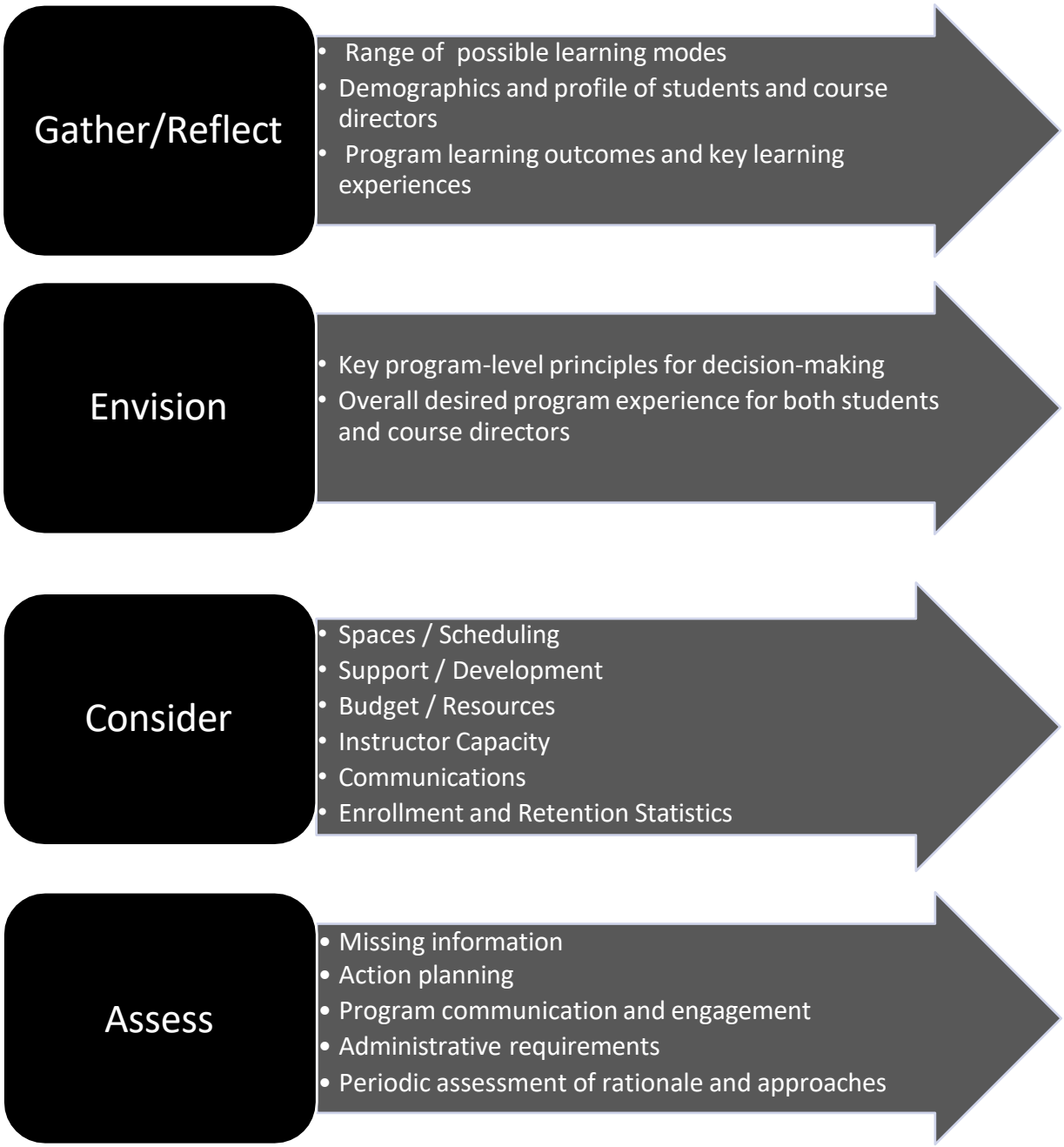


Figure 1: Overview of Decision-Making Process for Learning Modes

Gather/Reflect

What information do we need to make informed decisions about a custom program learning mode *mix?*

What are the available learning modes at York?

Table 1: York Learning Modes

	In-person	Virtual		Notes
		Synchronous	Asynchronous	
LECT	●			
HYFX	●	●		Concurrent synchronous in-person and live streaming
SEMR	●			This code is primarily used for graduate or smallupper-year undergraduate courses
ONLN		○	●	Instructor will define whether any synchronous components
BLEN	●	○	○	Instructor will define whether virtual components are synchronous or asynchronous

Consider Key Program Characteristics

In this step we attempt to articulate the key learning experiences and other identifying characteristics contributing to student achievement of the course and program outcomes.

Overall, what are the unique/critical needs of your program outcomes, students, and/or instructors? Articulate defining characteristics – consider:

- Signature learning experiences (Co-op, Field Experiences, Exchanges, Specialized Laboratories, etc.)
- Curricular structure (required courses, core electives, free electives, etc.)
- Student demographics
- Instructor expertise
- Program learning outcomes
- Unique or distinguishing characteristics of the program

(Fictitious) Example:
BSc. Program in Industrial Mathematics

Signature Pedagogies/Experience

Specialized courses/experiences in:

- Symbolic Computing Laboratory
- Differential Equations
- Mathematics Finance (Mathematics Theory of Interest)

- Linear Optimization (programming) (Laboratory)
- Regression Analysis (Statistics)
- Data-analytics Hands-on Experience (Laboratory)

Other Key Learning Experiences:

- Foundational breadth in mathematical skill sets (Calculus, Linear Algebra, and Probability)
- Three specific applied mathematics laboratory courses
- Small classes in the specialized courses where students will have a greater opportunity to build community, create relationships and share knowledge
- Propose solutions to complex applied mathematics problems (in all of the specialized courses)
- Learn from leading mathematicians
- Many of the courses have tutorials where students will receive closer attention, guidance and time to work on complex industrial mathematics problems
- Choice to focus on another areas of interest or continue to build mathematical skills with 39 free elective credits

Demographics of the Students:

- Most of the students will enter the program directly from high school with a strong affinity for Mathematics/Calculus
- Students will have completed high school calculus
- 50/50 mix of international and domestic students
- Students in the program are looking to be trained in in-demand skills (data science, data management, computer programing, advanced mathematics)
- Students in the program aim to be prepared for work in Industrial Math and related industries within 6 months of graduating

Program Learning Outcomes

Graduate of the BSc. Program in Industrial Mathematics will:

- Explain key concepts of Industrial Mathematics, and their applications to associated mathematical science (i.e., Scientific computing, computer science, statistics, actuarial science, economics)
- Know the established industrial mathematics techniques (i.e., Variational, integral, and partial differential equations, spectral and transform methods, combinatorics, numerical analysis)
- Critically evaluate and interpret applied mathematics information, develop questions and propose actionable solutions
- Identify and analyze complexities in applied mathematical problems
- Propose solutions to complex applied mathematics problems
- Effectively communicate applied mathematics concepts in a variety of mediums to varied audiences
- Identify ethical issues and implications in applied mathematics
- Demonstrate initiative, academic integrity, personal responsibility and accountability in laboratory and classroom settings

Consider Overall Rationale for Modes of Learning in your Program Context

For example:

Rationale for in-person classes: • Equipment access • Safety (e.g., labs) • Immediate and real-time feedback (e.g., counselling) • Coordinated synchronous and simultaneous learning (e.g., choir) • Connection to peers, course directors, supervisors, TAs and York University • Cohesion, spirit, community	**Rationale for non-in-person classes:** • Flexibility of location and time of learning • Diversity of learning approaches • Brings together local and at-a-distance students • Eliminate travel requirements for online student activities related to external engagement (e.g., webinar from guest mathematician, alumni-led workshop, etc.)

Envision

Envision program level principles for decision-making

Articulate related program values and how these values will be used to develop a *mix* of appropriate learning modes for the program.

Undergraduate Example:

As a program, we value:

- The importance of regular in-person contact of students, supervisors, TAs and instructors as foundational to the learning experience of our program
- Flexibility that a *mix* of learning modes can provide in terms of access, diverse learning styles and shared learning experiences
- That different modes of learning may work to support different program attributes and curricular
- Fact that each instructor, TA and student lives in different contexts and that there is no 'one size fits all' solution

As a result of these values, we will endeavour to:

- Offer orientation and other student resources and activities (e.g., student gov't) in hyflex and asynchronous modes
- Ensure all core (large enrollment or mandatory) courses offer sections in at least two learning modes (e.g., LECT + synchronous ONLN)
- Ensure that all capstone courses have an in-person component during weeks 9-11 during which a program-wide event of students will take place, showcasing student learning demonstration of achievement of learning outcomes. This will be recorded and made available asynchronously;
- Hold all non-curricular events via hyflex to allow for maximum student selection of their mode of engagement (orientation, etc.)

Graduate Example:

As a program, we value:

- The demonstration of fluency in comprehension of the literature in one of the program's fields of strength
- A reflection of the diversity of the discipline and continued evolution of intellectual pursuits

- The vital role of relationship building and partnership opportunities with community partners both inside and outside of the academy
- Collaboration and intellectual exchange as cornerstones of student development and ongoing growth as scholars
- The validation of a central research question through a comprehensive review of relevant literature
- The presentation of concepts, methods, and research findings to specialist and non-specialist audiences from within and beyond the discipline
- The development of interpersonal, research, independent learning, and communication skills as foundational to supporting professional pursuits

As a result of these values, we will endeavour to:

- Offer coordinated colloquium and collaboration opportunities via hyflex mode
- Support the personal and professional goals of students through effective mentorship and sustained relationship building both in-person and virtually.
- Deliver flexible asynchronous learning opportunities to support effective relationships between industry and our students

Consider

Articulate practical implications to a program mix of learning modes

Outline whether the program has the necessary resources to operate under one or more learning modes, including but not limited to the points below. You might also want to ensure input from various stakeholders (course directors, staff, students, administrators) in considering unintended consequences.

- Spaces (e.g., Do you have the access to the needed specialized learning spaces and/or technologies?)
- Scheduling (e.g., Can you coordinate course scheduling to best advantage the *mix* of program modes of learning?)
- Instructor and student capacity (e.g., do your course directors and students have the needed resources, support, expertise, etc. to prepare courses in the *mix* of learning modes?)
- Required resources. Will this program require:
    - Educational support? (e.g., optimizing the educational use of the different modes of learning for learning)
    - Administrative support? (e.g., need for minor, major and new course proposals)
    - Technical/technological support? (e.g., instructional design)
    - Equity, inclusivity, diversity support? (e.g., captioning, etc.)
    - Specialized software/equipment?
- Communications (e.g., how will you communicate the *mix* of learning modes to students, course directors and other program stakeholders?)

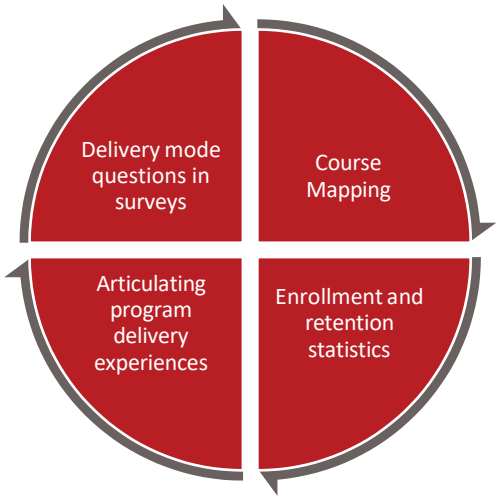
Assess

Periodically follow-up to ensure modes of learning *mix* meets the teaching and learning needs of the material, outcomes, students, and course directors

Having a *mix* of program learning modes will require program-level check-ins and feedback. You might consider:

- Integrating program-level learning mode questions into existing student surveys
- Program analysis through the mapping of courses by learning modes
- Providing ongoing developmental support for emergent modes of learning
- Reviewing how the program is described publicly to best articulate and promote the anticipated student learning experience

Figure 2: Ongoing Assessment of learning mode decisions



Example
BSc. Program in Industrial Mathematics

Deriving from the program's values, in concert with overall desired program experiences and current resourcing, modes of learning were determined through a course-by-course model (instructor-selected for each individual course/section).

Characteristics of this model:

- Department leads in consultation with individual instructors choose the learning mode based on their understanding of the most appropriate mode of learning, based pedagogical choices such as laboratory courses, tutorials, higher level specialized courses, and experiential learning.
- Consultation is undertaken to explore decision making by days of the week; in this case, ensuring Friday courses are online and synchronous, with a focus on professional development, general approaches to design and problem solving, and industry engagement.
- Students continue to have little choice in learning mode, as pre-pandemic, though options now include online learning in its various modes for large enrollment first year courses.
- From an institutional perspective, it is relatively easy to manage and schedule - not particularly disruptive
- Coordination of learning modes across courses is needed to reduce the likelihood of students engaging in online learning while being on campus, defeating much of its value, such as on Monday's.

Recognizes that program characteristics are deemed critical and program-level attention to learning mode is required for experiential learning components.

Sample Student Schedule- Pedagogy Based, with Friday's as online synchronous

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday** *(Friday courses are online and synchronous)*
8:00-9:00					
9:00-10:00	**ONLINE**	**FTF**	**ONLINE**	**FTF**	**ONLINE**
10:00-11:00					
11:00-12:00					**ONLINE**
12:00-1:00					
1:00-2:00	**FTF**	**FTF**		**FTF**	
2:00-3:00					
3:00-4:00					
4:00-5:00					

Ongoing assessment and consultation with various stakeholders will determine learning modes as the program, opportunities and available resourcing continually evolves.

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