PROPOSAL

# Climate Adaptation Micro-Credential Strategy

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Adaptation Learning Network
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# CLIMATE ADAPTATION MICRO-CREDENTIAL STRATEGY



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# The Climate Adaptation Imperative

Capacity-building for advancing climate-change-related leadership has become a critical workforce development requirement for both professionals and front-line workers in 2022. There is an urgent need to address the growing impacts and risks of climate change, and workers require upskilling quickly and conveniently through micro-learning experiences to fulfil this critical requirement in corporate, government, small-business, consulting services and NGO roles.

The Royal Roads University (RRU) Adaptation Learning Network (ALN) Climate Adaptation Micro-credential strategy is focused on responding to climate impacts (climate adaptation) and aligns to the BC Draft Climate Preparedness and Adaptation Strategy. This specific micro-credential strategy is focused on "how to deal with the ever-worsening effects of climate change," through a strategic foresight approach that provides upskilling opportunities to address climate adaptation in focused domains of knowledge and skill.

As BC experienced in Summer 2021, communities have been hard hit by the impact of just 1°C of warming, from extreme heat to uncontrollable fires to the issues of both drought and flooding, and the inevitability of sea level rise in BC's coastal communities. Recent events resulting from excessive rainfall have also demonstrated the fragility of infrastructure and services across British Columbia, requiring us to rethink, prepare for a changing climate, and invest in human, natural and physical infrastructure that advances climate adaptation knowledge and skills. This micro-credential strategy and its related programs and courses are important steps in making preparation widely available to learners who are professionals and front-line workers in many sectors.

The Climate Adaptation Micro-credential Strategy is based on a set of courses, developed as open educational resources (OER) through the Adaptation Learning Network (ALN), an initiative funded by Natural Resources Canada (NRCan) BRACE and BC Ministry of Environment and Climate Change Strategy.

In addition to developing prototype courses, RRU-ALN has researched and developed a Climate Adaptation Competency Framework (CACF). The CACF comprises five competency domains, each with five sub-competencies, aligned with this Climate Adaptation Micro-credential Strategy, providing competency-based training in core knowledge and skill domains, keyed to the CACF, and focused in critical leadership areas including:

- Climate Change Adaptation Fundamentals
- Perspectives on Transition Leadership
- Financial Impact of Climate Change

To be awarded the Climate Action Practitioner – Foundation micro-credential, learners will complete three core courses and choose an elective course from one of the following specialties:

- Natural Asset Management
- Operationalizing Transition Leadership
- Introduction to Climate Policy for Climate Adaptation Professionals

# RRU-ALN Micro-Credentials as Skill and Competency Enablers

## Micro-Credentials as a Workforce Strategy

Micro-credentials have been proposed as a strategy to enable the ongoing development of knowledge and skill across the workforce. As the World Economic Forum Jobs 2020 report (2020) noted, there is an increasing need to provide short-timeframe opportunities for re-skilling and upskilling that will not diminish as we move forward. The University of Waterloo (2021) emphasizes that "upskilling facilitates continuous learning by providing training programs and development opportunities that expand an employee's abilities, minimize skills gaps and enable career growth." These discussions are critical and set an agenda for rethinking our approach to learning and training. They advance our understanding of credentialing, and more broadly advance the need for innovative practices to better align with workforce development through targeted programs that can be recognized with credentials and achieved in a faster, more focused manner than conventional programs.

In workplace environments increasingly defined by performance frameworks which require ongoing professional learning, individuals are encouraged and are often incentivized by their employers to demonstrate their capabilities and commitment to professional growth. New forms of credentialing that have emerged, such as micro-credentials, enable a clear demonstration of what individuals can do, and serve to better empower individuals to demonstrate their knowledge and skills. In this context, micro-credentialing can bring specific recognition to individuals' competencies and further reinforce the capability of the workforce more generally to deal with emergent needs, such as in the domain of climate adaptation, which is the subject of this strategy document for the RRU-ALN.

> *Effective adaptation requires a comprehensively addressed and interrelated framework. Financial investments, institutional arrangements, knowledge and skills development, data and information usage, international cooperation and resource mobilization are just a few key dimensions to look into in the construction of any adaptation framework. (UNESCO, 2021).*

Much has been written over the past five years on the topic of matching workforce needs to professional programs that can be achieved in short timeframes. Micro-credential definitions exist but there is no agreed standard. Rossiter and Tynan (2019) proposed that, "unlike more formal qualifications, such as the degree, which has some intra-global frameworks, the fledgling world of micro-credentials has no such framework." They offer some parameters including that, "a micro-credential is shorter… and can represent from one to 100 hours of learning, may or may not be certified by an accrediting institution or association, and may be taken online or as a face-to-face experience."

Oliver (2021) has led a UNESCO initiative to better define the attributes of micro-credentials and their relationship to existing credential frameworks. The preliminary UNESCO report has offered initial commentary on micro-credential attributes. A micro-credential is: 1. is a record of focused learning achievement verifying what the learner knows, understands or can do; 2. includes assessment based on clearly defined standards and is awarded by a trusted provider; 3. has stand-alone value and may also contribute to or complement other micro-credentials or macro-credentials, including through recognition of prior learning; and 4. meets the standards required by relevant quality assurance.

Presant (2021) has argued that emerging micro-credentialing pathways are also on a continuum. At one end, micro-credentials are formal, summative, and authenticated by a legitimate learning institution and at the other end lies open badges, which he views as informal, formative and authenticated by any issuer, which might include a legitimate learning institution. In this context, it is possible to see how micro-credentials can be both non-credit and credit-bearing, depending on how they are assessed and positioned within established credentialing systems. LinkedIn Learning stands as an example of informal, focused, short-duration learning where recognition of achieved skills is "badged" in a manner appealing to both learners and employers.

Regardless of whether an individual or an institution may seek, offer, display or interpret a micro-credential, these new credential formats are important pathways for enhanced employability and productivity. They empower individuals to showcase what knowledge and skills they have and provide objective, secure, and digitally-signed information to allow organizations to have better metrics on what their employees know and can do, based on commonly accepted standards of practice represented in competency frameworks.

> *In skills, education and training policy around the world, micro-credentials are increasingly being positioned as a solution to a wide range of economic, labour market, and social challenges. Broadly defined, they are stackable, industry-aligned short units of learning designed to help individuals form specific skills and signal those skills to employers. Although micro-credentials were gaining increasing policy traction prior to 2020—in part due to the affordances of digital technologies for effectively delivering short courses online—the economic disruption caused by COVID-19 appears to have catapulted them to the foreground of policy and industry discourse. (OECD Forum, Sept 2021)*

## Open Competency Frameworks

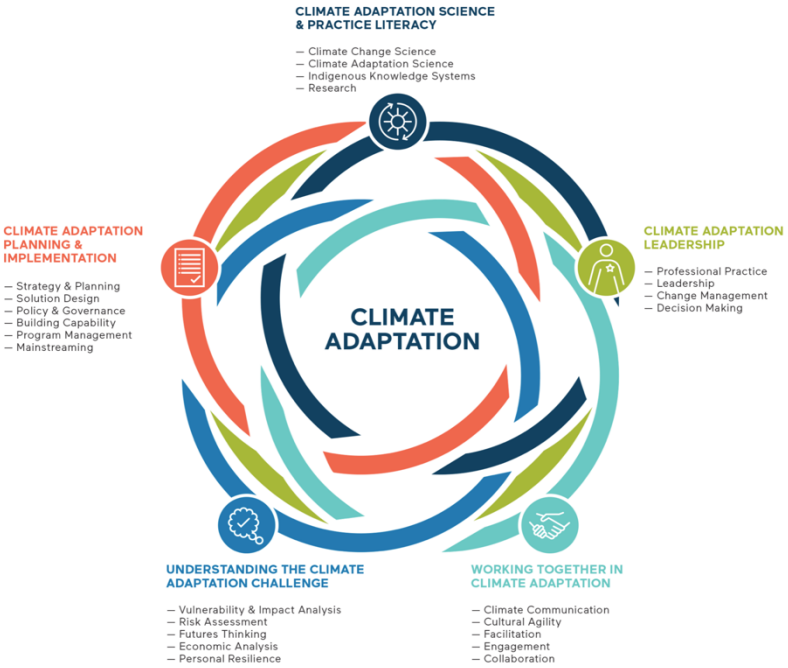
On the horizon is the idea of open competency frameworks, another means of specifying explicit competencies in domains of skill and knowledge. eCampusOntario has developed an *Open Competency Toolkit* (Green & Levy, 2020) to provide momentum for open competency frameworks.

Organizations outside of academia which are primarily employer-facing are already exploring work in the open competency domain. Forth (2020) has noted that, "Open Competency Models are an important innovation for everyone concerned with building capabilities, improving human performance and realizing the potential of individuals, teams, organizations and professions." Forth further noted that it would be important for open competency models to be assigned an open, Creative Commons license, "so that everyone can use and evolve them at no charge."

Applying open thinking to make a better match between humans, their skills, and workforce needs is an emerging opportunity, and central to the RRU-ALN Climate Adaptation Micro-credential Strategy.

## Climate Adaptation Competency Framework

RRU-ALN's Climate Adaptation Competency Framework (Cox, Niederer, Forssman & Sikorski, 2020) is an openly-licensed competency framework that is aligned with the development of micro-credential programs targeted at professionals in workforce sectors where climate adaptation capabilities and strategic foresight for dealing with adaptation challenges are critical skills for the future of work.




# Digital Transformation as a Catalyst for Rapid Upskilling

The move to upskill and re-skill individuals for a dynamically changing economic environment affected by climate change and other unforeseen global challenges has also become integral to recovery and resilience strategies for a post-COVID world (Davidson, 2020). Consequently, the need to harness digital transformation in ways that better equip individuals and institutions to respond to opportunities for further learning and differentiated employment is a new imperative.

Micro-credentials provide viable and expedient pathways to explicitly certify competence and facilitate the match between individuals and employment opportunities. Higher education institutions are well-placed to operate within and advance this upskilling strategy as micro-credential providers, though they will need to be innovative in their thinking about assessment, credentialing, and prior learning, as well as the emerging opportunities for laddering micro-credentials into graduate certificates and degree programs.

In a 2018 paper, Gary Matkin of the University of California Irvine presented a clear and cogent overview of the need to rethink the ways in which higher education institutions provide credentials for learners. He noted:

> *Alternative Digital Credentials (ADCs) will significantly transform the relationship between higher education institutions and society. By providing fully digital, workplace-relevant, and information-rich records of an individual's skills and competencies, ADCs will render traditional university transcripts increasingly irrelevant and obsolete. Universities and colleges that do not adopt in some measure the ADC movement will*

*begin to experience a slow decline in market position and patron support. (Matkin, 2018, p.1)*

Matkin suggested that ADCs, including micro-credentials, were a better match with current societal realities driven by the needs of learners and employers. Digital credentials can capture rich, dynamic and verifiable information about the skills and competencies that individuals possess. They might also identify the shelf life of the skill and competency, fostering in the process a mindset of continuous upskilling for individuals and a layer of legitimacy to employers or registrars. In this vein, Matkin proposed that digital learning records would evolve and grow over time as the individual acquired additional knowledge and skills inside and outside classrooms.

Digital micro-credentials are a reflection of the short- and long-term transformations occurring in the workplace. The broad sectors of finance, construction, manufacturing and services are being redefined by technology, and both individuals and corporations need to adapt irrespective of sector. Higher education institutions can be a central player in micro-credentialing practices but will need to develop and support learning pathways that complement, if not diverge from conventional degrees, diplomas and certificates. Digital micro-credentials present a unique opportunity to acquire specific knowledge or skill captured in a credential that accurately verifies what its holder can do.

While debates on standards for micro-credentials unfold, governments and their institutions of higher learning must recognize the opportunity presented by micro-credentialing to underpin new approaches to workforce development, and especially in the domain of climate action where the RRU-ALN is a thought-leader in the Canadian context through its Climate Adaptation Competency Framework.

# Designing RRU-ALN's Climate Adaptation Micro-Credential Strategy

## Resources and guiding documents provide scaffolding for the Climate Adaptation Micro-credential Strategy

Four recent documents that guide this strategy document include:

- ContactNorth (2021). *10 key actions to ensure micro-credentials meet the needs of learners and employers.*
- Ministry of Advanced Education and Skills Training, British Columbia (2021). *Micro-credential framework for B.C.'s public post-secondary education system.*
- Oliver, B. (2021). *A conversation starter: towards a common definition of micro-credentials.*
- Pichette, J., Brumwell, S., Rizk, J., Han, S. (2021) *Making sense of micro-credentials.*

In addition, the *Micro-Credential Creation Template* (CanCred.ca, 2021) serves as a high-level design summary that outlines the intent of a micro-credential, its value proposition for earners, issuers and consumers (e.g., employers), along with descriptions of the award, its assessment criteria, its alignment with competency frameworks, endorsements for employers, and validity timespan (e.g., expiry date).

Together these documents, published in 2021, provide the most current criteria for consideration in framing a micro-credential strategy. They guide the design of micro-credential programs, along with course development and a need for competency-based assessments. They also specify the nature of a micro-credential award and the award's authentication using a secure, digitally-rendered critical information summary (digital metadata).

## Core Principles for a Climate Adaptation Micro-Credential Strategy

Definitions for micro-credentials exist from multiple organizations. A recent UNESCO working document (Oliver, 2021) provided examples of 16 definitions from global higher education providers as an example of the scope of existing definitions, and need for clarity and specificity, which UNESCO is undertaking through its working-group consultation process.

What is needed by RRU-ALN is clarity about its micro-credential programs to allow them to be marketed effectively to selected learners, while also providing sufficient information to developers, institutions, and employers to ensure their validity in the workplace and within institutional structures. It is both conceivable and strategic that RRU-ALN might include consideration of micro-credentials that absorb, mirror, or add value to specific industry certifications such as the Infrastructure Resilience Professional (IRP) certification by Engineers Canada, offered through Climate Risk Institute.

The Higher Education Quality Council of Ontario (HEQCO) provides a very clear definition that would work well for marketing micro-credential programs:

> *A micro-credential is a representation of learning, awarded for completion of a short program that is focused on a discrete set of competencies (i.e., skills, knowledge, attributes), and is sometimes related to other credentials. (Pichette, J., Brumwell, S., Rizk, J., Han, S., 2021)*

The image conveyed by the HEQCO definition is of a program that is short, focused, and competency-based and that provides an award that recognizes a combination of knowledge and skills. This definition's approach could be "tuned" in ways to provide a consistent set of marketing messages targeted at learners in various professions who might wish to acquire high-currency knowledge and skills aimed at climate adaptation leadership and action.

Additionally, the HEQCO research team provides guidance for key features for emphasis in describing and designing micro-credential programs. They cite the following as defining features of micro-credentials (Pichette, J., Brumwell, S., Rizk, J., Han, S., 2021, p. 5).

- **Narrow scope:** Micro-credentials focus on developing a discrete set of competencies. In contrast, traditional credentials focus on a comprehensive set of interrelated competencies.
- **Short completion time:** A narrow scope of learning allows students to obtain micro-credentials faster than most traditional credentials.

The HEQCO team also describes the “quality markers” that learners and employers will look for to ensure the validity of micro-credentials. These quality markers are on the critical path for institutions, and must be explicitly addressed in RRU-ALN’s Climate Adaptation Micro-credential designs (Pichette, J., Brumwell, S., Rizk, J., Han, S., 2021, p. 16).

- **Relevant:** Consulted or involved industry or community
- **Accredited:** Recognized or issues by a professional accrediting body
- **Standardized:** Meets government-set quality standard
- **Assessed:** The learner must demonstrate skills/knowledge to earn the credential
- **Flexible:** The pace and/or structure of learning can be personalized
- **Stackable:** Can be “stacked” or combined toward a larger credential, e.g. a diploma or degree

The UNESCO proto-definition stated in its recent working paper (Oliver, 2021) provides a deeper technical approach that can add specificity and authority to micro-credential programs, their course designs, their award structures, and their relationship to existing qualifications frameworks.

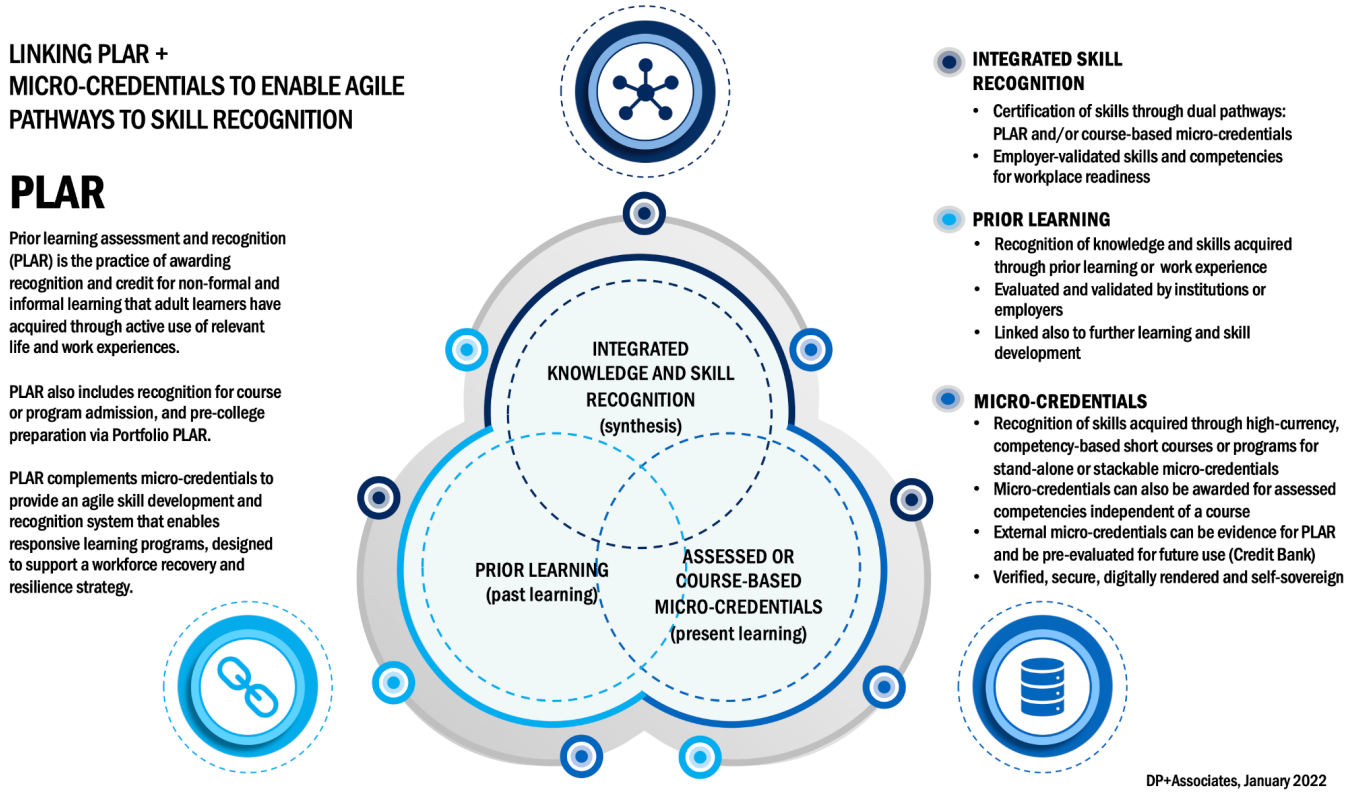
The UNESCO definition states that a micro-credential is:

- *a record of focused learning achievement verifying what the learner knows, understands or can do*
- *includes assessment based on clearly defined standards and is awarded by a trusted provider*
- *has stand-alone value and may also contribute to or complement other micro-credentials or macro-credentials, including through recognition of prior learning*
- *meets the standards required by relevant quality assurance*

The UNESCO approach includes definitional elements that can be used to create design specifications for micro-credentials that emphasize the verification of knowledge, skills, and attributes against a clear set of standards assessed by a trusted provider in the context of a quality assurance framework.

## An Ecosystem View of Micro-credentials

The UNESCO definition visualizes an ecosystem in which micro-credentials exist, where they can have standalone value, or ladder or stack with other kinds of credentials or recognition processes including prior learning, as represented in the pathways to skill recognition diagram from Porter (2022).




## Ensuring Climate Adaptation Micro-Credential Validity in the British Columbia Context

RRU-ALN's Climate Adaptation micro-credentials will be available initially within the jurisdiction of British Columbia's higher education system. As such, it is imperative that the strategy and operational framework for the RRU-ALN micro-credentials align closely with the BC Ministry of Advanced Education and Skills Training's recently published Micro-credential Framework for BC's Public Post-secondary Education System (MAEST, 2021). The framework provides a definition for micro-credentials that strikes a balance between the high-level HEQCO definition and the emerging detailed definition from UNESCO.

> *Micro-credentials recognize stand-alone, short duration learning experiences that are competency-based, align with industry, employer, community and/or Indigenous community needs and can be assessed and recognized for employment or learning purposes.*

The BC Micro-Credential Framework outlines the attributes of micro-credentials that should be formally addressed by education providers to demonstrate alignment. The table below describes the framework elements and proposed alignment to the framework for RRU-ALNs Climate Adaptation micro-credentials.

| British Columbia Micro-Credential Framework Elements | Narrative descriptions of the framework elements | Alignment of the RRU-ALN's Climate Adaptation Micro-Credentials with the BC Micro-Credential Framework |
|---|---|---|
| **Duration** | Individual micro-credentials should be sufficient in length for learners to acquire the competency being sought and be shorter in duration than other formal post-secondary credentials (under 288h) | In Phase 1, Royal Roads University plans to offer short, focused courses (25h) that are awarded the RRU-ALN Climate Adaptation Micro-credential that recognizes competence in four domains, after completion of three core courses and an elective course for 100h in total learning. |
| **Delivery** | Micro-credentials can be delivered in a variety of flexible formats, including in-person, online or blended, synchronous or asynchronous, or a combination of multiple formats.<br><br>Delivery formats should support and be relevant to the competency being taught. In considering delivery formats, institutions should use processes to reduce barriers, increase access and mobility and meet the unique needs of learners. | Much of the target audience for the Climate Adaptation Micro-credential will be currently employed in positions where they can have significant impact or influence in decisions made by corporations, banks and credit unions, municipalities, consulting firms or governments.<br><br>Royal Roads University (and potentially partner organizations) will offer the RRU-ALN Climate Adaptation micro-credentials online using the Moodle LMS, supplemented by web conferences, streaming media, and an online discussion platform to provide for delivery flexibility. |
| **Collaboration and coordination** | Post-secondary institutions will work with relevant employers/industry, non-profits, Indigenous communities, institutes and organizations and other community stakeholders in the identification, development and validation of micro-credentials.<br><br>Micro-credential development will be informed by evidence of labour market, community and/or Indigenous needs. | The RRU-ALN is informed through an active Advisory Board which meets quarterly and includes representation from several BC professional associations such as EGBC (engineers), BCSLA (landscape architects), PIBC (city planners), ABCFP (foresters), CAB (biologists), and BCIA (agrologists).<br>In addition, the BC Ministry of Environment and Climate Change Strategy has financially supported consultations between RRU-ALN and Indigenous leaders to inform the design and development of an optional self-paced course module on Indigenous Perspectives on Climate Change. |

| British Columbia Micro-Credential Framework Elements | Narrative descriptions of the framework elements | Alignment of the RRU-ALN Climate Adaptation Micro-Credentials with the BC Micro-Credential Framework |
|---|---|---|
| **Quality assurance** | Micro-credentials will be developed, approved and periodically reviewed, through an institutional process that aligns with existing post-secondary standards and policies, for credit and non-credit offerings, to ensure value to learners in meeting education or employment goals. | The RRU-ALN Climate Adaptation Micro-credential strategy is based on the principle of quality assured courses that meet commonly accepted standards of practice. These micro-credentials will meet institutional standards at RRU and will align with Climate Adaptation Competency Framework (CACF) that was developed with federal and provincial funding, overseen by the RRU-ALN Advisory Board which consists of industry and corporate professionals. |
| **Assessment** | Assessment of a student's learning is required to ensure learners have achieved the intended competency. Assessment should be relevant to how employers recognize a competency has been obtained. | The RRU-ALN Climate Adaptation Micro-credentials will use the CACF for the design and assessment of the courses. Project-based assessments keyed to CACF rubrics will provide sufficient scope for focused knowledge and skill acquisition by participants, relevant to their own unique work environments. https://adaptationlearningnetwork.com/climate-adaptation-competency-framework |
| **Registry** | Further work is being undertaken to consider a common registry to facilitate access, understanding, and further development of the micro- credential ecosystem. | RRU-ALN Climate Adaptation Micro-credentials will be designed and implemented by RRU to support the concept of a micro-credential Registry. The creation of a Registry by MAEST will further validate the utility of focused, competency-based programs as pathways to skills that contribute to workforce development. |

| British Columbia Micro-Credential Framework Elements | Narrative descriptions of the framework elements | Alignment of the RRU-ALN Climate Adaptation Micro-Credentials with the BC Micro-Credential Framework |
|---|---|---|
| **Learning pathways** | Micro-credentials may be credit or non-credit bearing, and this should be made explicit to learners prior to enrolment. In order to create meaningful learner pathways, micro-credentials should be developed in a manner that shows how they:<br>● relate to other credit and non-credit bearing opportunities,<br>● connect with existing larger units of learning, and,<br>● remove barriers and create clear and varied pathways for learning.<br><br>Post-secondary institutions are encouraged to collaborate internally and with other post- secondary institutions in developing micro-credentials to increase opportunities for transfer, laddering or stacking. | Credit or no-credit awards can be earned for the Climate Adaptation Micro-credential. Participants taking the micro-credential will be assessed using relevant, authentic and project-based assessment strategies linked to the CACF competencies. In both cases, a specific digital certification will be awarded, with authentication and endorsement by employers and/or professional associations.<br><br>A prior learning assessment and recognition (PLAR) process will provide opportunities to use the micro-credential as credit for or to ladder into credit programs (e.g., RRU MA/Graduate Diploma in Climate Action Leadership - MACAL, which already uses a PLAR process. |
| **Prior learning assessment and recognition** | Prior learning assessment and recognition (PLAR) should be considered when offering micro-credentials. | The CACF, through its 5 competency domains and 25 sub-domains, provides a clear framework against which to assess climate adaptation competencies through the demonstration of prior knowledge and skills. Portfolios and challenge exams are the mechanisms RRU-ALN will use to enable PLAR pathways to the micro-credential. |
| **Post-secondary system recognition and transfer** | Micro-credentials should facilitate learner mobility across institutions, industries, and credentials, and not introduce barriers to learning, transfer or labour market participation.<br><br>Credit bearing micro-credentials should be recorded on a learner's transcript or other official record. Recognition of non-credit bearing micro-credentials should be done in a manner that supports identification of the specific competencies obtained. Micro-credentials, where possible, will integrate with existing credit transfer processes. | RRU-ALN will provide clear documentation on its micro-credential programs for use by the BC Council and Admissions and Transfer (BCCAT), and for use with a proposed BC Micro-credential Registry.<br><br>RRU-ALN will seek pan-Canadian recognition to support firms with employees in several provinces and to enable labour mobility and recognition, in the context of any national micro-credential registry that might be initiated by the Council of Ministers of Education Canada (CMEC). |

## Ensuring RRU-ALN Climate Adaptation Micro-Credential Validity for Learners and Employers

Contact North (2021) has recommended guidelines to ensure that micro-credentials meet the needs of learners and employers. The Climate Adaptation micro-credentials align with the Contact North guidelines, as outlined in the table that follows.

| **Contact North's 10 Key Actions To Ensure Micro-Credentials Meet The Needs Of Learners And Employers** | **Alignment of the RRU-ALN Climate Adaptation Micro-Credentials with The 10 Key Actions** |
|---|---|
| **1. Make a clear connection between learning modules, the credentials offered and skills or qualifications frameworks.** | The RRU-ALN courses align with the Climate Adaptation Competency Framework (CACF), which has five competency domains and 25 sub-competencies that address knowledge and skills related to climate adaptation and action. The Climate Adaptation Micro-credentials consist of four courses, each of which clearly aligns with the CACF competency domains. |
| **2. Link micro-credentials to the in-demand (or soon to be in-demand) skills and competencies employers are actually seeking.** | RRU-ALN, with funding from the federal and provincial governments, is a key contributor to RRU's climate action plan, and by extension to the development of programming that matches the needs for climate adaptation knowledge and skills by professionals in various roles in industry, finance, or government. |
| **3. Engage employer organizations or professional bodies in the design of micro-credentials at the earliest possible stage.** | The RRU-ALN is working with employers to test the viability of the CACF. In Fall 2021, RRU-ALN tested the CACF with a Vancouver-based environmental consulting firm. Using a self-assessment tool and a visualization process based on the data generated from the study, RRU's team worked collaboratively with the company to surface the gaps in climate adaptation knowledge and skills. The results of the assessment of capability demonstrated clear areas of need for addressing climate adaptation competencies within professional firms. The environmental consulting firm was of the opinion that its primary interest would be rapid and targeted resources to accomplish the upskilling process. The RRU-ALN team is poised to further test the CACF with municipalities and other companies to confirm key areas requiring knowledge and skill upgrades to advance uptake of micro-credentials. |

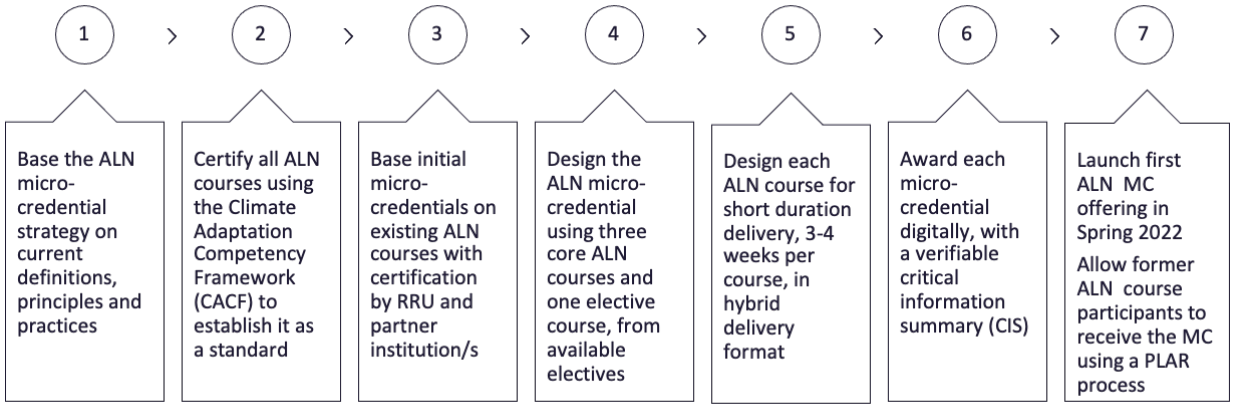
| Contact North's 10 Key Actions To Ensure Micro-Credentials Meet The Needs Of Learners And Employers | Alignment of the RRU-ALN Climate Adaptation Micro-Credentials with The 10 Key Actions |
|---|---|
| **4. Strengthen the focus on demonstrable competencies and reduce the over-reliance on "soft" assessments of what the learner can actually do.** | The RRU-ALN Climate Adaptation Micro-credentials will use the CACF for the design and assessment of the courses. Project-based assessments keyed to CACF rubrics will provide sufficient scope for focused knowledge and skill acquisition by participants, and demonstrations of competence relevant to their own unique work environments. In addition, RRU-ALN is adding technical competencies to the CACF based on courses designed by the Climate Risk Institute (CRI). |
| **5. Launch a national conversation, perhaps facilitated by the Future Skills Centre in partnership with the Council of Ministers of Education Canada, on the portability of micro-credentials.** | RRU-ALN supports a national conversation on micro-credentials focused on climate adaptation needs. The RRU-ALN is focused on capacity-building to address these issues. RRU-ALN is operated through the Resilience by Design Lab at Royal Roads University and is funded by Natural Resources Canada BRACE and the BC Ministry of Environment and Climate Change Strategy.<br><br>A logical next step is to provide a national perspective for this work, which the RRU-ALN is currently initiating through a concept called CAN-ADAPT, a network of universities, colleges, government agencies, NGOs, and other interested parties who seek to establish national targets for upskilling the Canadian workforce to deal with climate adaptation and action. |
| **6. Identify those micro-credentials that can be laddered into undergraduate and graduate programs and ensure they are nationally portable.** | RRU-ALN is designing laddering pathways for its micro-credentials to the RRU MA in Climate Action Leadership (MACAL). |
| **7. Clearly identify the mode of delivery for each micro-credential. Not all will be online.** | RRU-ALN micro-credentials are delivered using a hybrid model that provides for asynchronous online delivery of course materials along with synchronous events using web conferencing software. The hybrid model reflects a desire to service the learning needs of working professionals, many of whom have become proficient in their use of online and technology-enabled learning platforms. |

| Contact North's 10 Key Actions To Ensure Micro-Credentials Meet The Needs Of Learners And Employers | Alignment of the RRU-ALN Climate Adaptation Micro-Credentials with The 10 Key Actions |
|---|---|
| **8. Encourage employers to partner with colleges, universities and Indigenous institutes in the design of work-based learning micro-credentials.** | RRU-ALN is already active with higher education institutions and Indigenous institutes, firms, and knowledge-keepers in the design of its existing courses and micro-credentials. |
| **9. Identify and develop assessment-only micro-credentials.** | RRU-ALN micro-credentials will use recognition of prior learning (RPL) as one method for demonstrating competence with the CACF, and its 5 competency domains and 25 sub-domains. The CACF provides a clear framework against which to assess climate adaptation competencies through the demonstration of prior knowledge and skills. Portfolios and challenge exams are the mechanisms RRU-ALN will use to enable RPL/PLAR pathways to the micro-credential. |
| **10. Foster more collaboration within and between provinces to strengthen the skills, competencies and capabilities of Canadians seeking work or upskilling to improve their job prospects.** | The CAN-ADAPT network being launched by RRU-ALN in 2022 will become the vehicle for collaborative development and the sharing of climate adaptation courses and micro-credentials among universities, colleges, and private-sector course providers (such as Academy for Sustainable Innovation), across Canada. |

# RRU-ALN Climate Adaptation Micro-Credential Strategy

## Phase 1: Climate Adaptation Foundation Micro-Credential

There are seven (7) key steps in implementing the RRU-ALN micro-credential strategy:




### 1. Base the RRU-ALN Climate Adaptation Micro-credential strategy on current micro-credential definitions, principles and practices.

The RRU-ALN strategy will focus primarily on guidance provided by the BC Micro-credential Framework, its micro-credential definition and core principles. Definitions and principles provided from research conducted by the Higher Education Quality Council of Ontario (2021) and UNESCO (2021) will supplement the approach.

### 2. Certify all RRU-ALN courses using the Climate Adaptation Competency Framework (CACF) to establish a standard for marketing and employer validation.

The CACF provides an established set of competencies in each of five practice domains. There are 25 sub-domain competencies which can be used to guide instructional development of the RRU-ALN courses to add knowledge and skill components to the courses that can be evaluated using competency-based assessments. It is imperative to activate the CACF as the practice standard for the RRU-ALN program by taking the following steps:

- Refine the learning objectives and course scope for each existing RRU-ALN course to clearly align with the Climate Adaptation Competency Framework (CACF)
- Seek endorsement of CACF and RRU-ALN courses from an external accreditation body - American Society of Adaptation Professionals, or a Canadian professional body
- Market the CACF as the micro-credential certification standard for RRU-ALN courses awarded by RRU and partner institutions in the CAN-ADAPT Network

In addition, the RRU-ALN courses will require further instructional design input to ensure that their learning outcomes and assessment strategies are congruent with the CACF and a certification of competency as a clear outcome of the courses. The following steps are recommended as part of the micro-credential development process:

- Define and clearly state the purpose for the RRU-ALN micro-credentials
- Specify course learning objectives and their relationship to the CACF competency domains
- Demonstrate alignment of learning objectives and outcomes (KSAs: knowledge, skills, attributes) with emergent requirements and employability value, and seek endorsement from an external validator such as an employer
- Create appropriate assessment to verify RRU-ALN courses and their KSAs
- Create an updated modular curriculum specification for the CACF domains with certified recognition elements based on the RRU-ALN micro-credential framework and maintain its currency

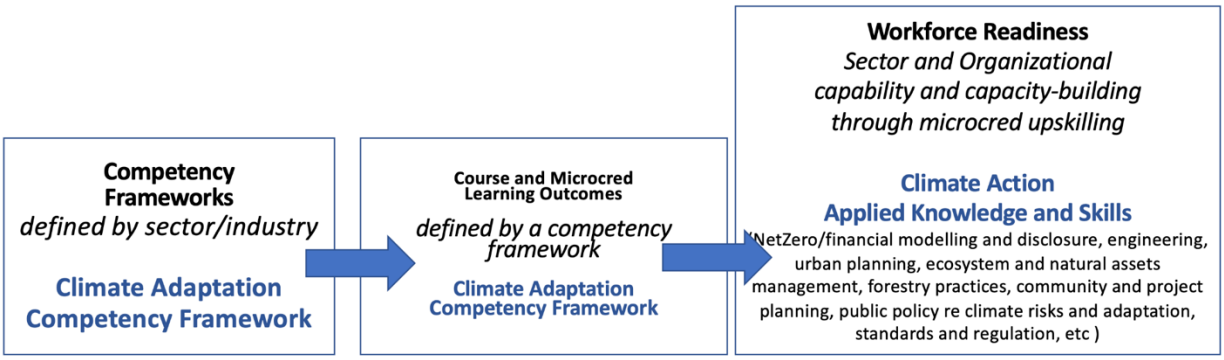
## 3. Base initial RRU-ALN micro-credentials on existing courses with certification by RRU and partner institution/s.

The RRU-ALN micro-credential program will use existing short courses created through funding from Natural Resources Canada (BRACE) and the BC Ministry of Environment and Climate Change Strategy. The 11 continuing professional development courses are currently offered to working professionals through five BC post-secondary institutions (University of BC, Simon Fraser University, University of Victoria, Vancouver Island University, and Royal Roads University). They will require upgrading to add knowledge and skill components and competency-based assessments.

Additionally, the RRU-ALN micro-credential program will use the Climate Adaptation Competency Framework (CACF), developed through consultation with worldwide experts, for its outcomes and assessment strategies. The CACF was tested in 2021 to determine how best to identify and address organizational competency gaps vis-à-vis climate adaptation domains of knowledge.

Competency frameworks such as the CACF can be used to specify a set of learning outcomes which can be implemented in courses across a program. Thematic courses can be designed to match workforce needs and the resulting micro-credentials in turn become upskilling pathways for climate adaptation knowledge and skills in sectors such as finance, urban planning, engineering, and government services.

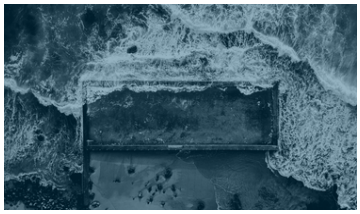
Together the existing RRU-ALN courses and the CACF will be used (along with other potential courses from the Climate Risk Institute), as the foundation to create a micro-credential program designed to upskill professionals with climate adaptation knowledge and skills as outlined in the diagram that follows.




## 4. Design the Phase 1 RRU-ALN micro-credential using three core RRU-ALN courses and one elective course, from available electives

For the Climate Adaptation Micro-Credential, each micro-credential course is taken in a hybrid format and is 25 hours in length and completed over 3-4 weeks. Assessment for credit pathways will be a relevant project-based assignment. The credit-based micro-credential award will be a digital certification from RRU with endorsement from corporations and/or professional associations.

### Climate Action Practitioner Foundation: Three core courses + elective



Climate Change Adaptation Fundamentals

Perspectives on Transition Leadership

Indigenous Knowledge & Perspectives on Climate Adaptation

### Elective courses: Choose one

Natural Asset Management

Financial Impact of Climate Change Transition Leadership

Introduction to Climate Policy for Climate Adaptation Professionals

## 5. Design each RRU-ALN course for short duration delivery (3-4 weeks per course), hybrid delivery

Each RRU-ALN course will be designed for 25 hours of learning, in a hybrid format that includes asynchronous online learning (using learning management system templates) and synchronous learning opportunities (using web conferencing and ideation tools). In addition, media and resources will be available for asynchronous review, along with discussion boards for interaction among participants and the instructors.

## 6. Award each micro-credential digitally, with a verifiable critical information summary (CIS)

Critical information summaries (digital metadata) provide enhanced verification of skills within digital badge or certification systems (e.g., using MyCreds.ca, Badgr, CanCred.ca). RRU-ALN will define metadata for its courses based on the CACF as its standard. The illustration that follows provides an example of the metadata contained in the digital records of micro-credentials awarded through micro-credential systems such as MyCreds.ca, CanCred.ca, or Badgr.

### Level

Novice | Performer | Expert

### Critical Information Summary

[Optional section that can improve the portable recognition value of the credential.]

[KEEP ALL LIST ITEMS, DELETE OPTIONS THAT DON'T APPLY.]

- **Title:** see above
- **Issuer:** see above
- **Country/region of the issuer:** Country/region or NA
- **Date of issue:** see above
- **Description:** see above
- **Learning outcomes:** see above
- **Effort including assessment:** XX hours
- **Duration:** XX (days, weeks or months) or NA
- **Prerequisites:** If any or None
- **Relevant learning resources:** If any or None
- **Type of recognition:** Course - summative assessment | Course - formative assessment/participation | Stack or programme | Certification | Other (describe)
- **Type of assessment:** Examination/quiz | Demonstration | Observation | Interview | Evidence package | Other (describe) | NA
- **Participation:** Online | On-site | Both
- **Supervision:** Yes | No
- **Identity verification:** 2 factor | 1 factor | None
- **Estimated ISCED level:** [e.g. 5 or 55 or 551] (unverified unless otherwise stated) | Not declared
- **Quality assurance:** External | Internal (Describe)
- **Endorsement:** No | Yes (describe)
- **Learner impact:** Degree programme admission | Academic credit(s) | Nonformal/Professional Certificate | Nonformal/Professional Certification / Advanced standing/progression
- **Credits:** XX (units/system, eg 3 ECTS) if any or None
- **Stackability:** Standalone | Designed to stack | Stack
- **Further information:** if any or None

Adapted from Oliver (2019), Orr et al (2020) and Shapiro (2020)

*atingi CIS version 2021-09-02*

Not included from Shapiro 2020:

## 7. Launch first RRU-ALN Climate Adaptation Micro-credential offering in Spring 2022.

The earliest launch date for RRU-ALN micro-credentials is March 2022, a prototype offering that will be followed by a full launch in the fall of 2022, the latter requiring marketing beginning in April 2022.

## Phase 2: Future Pathways to Upskilling Adaptation Competencies

Based on discussions with RRU-ALN partners and the availability of RRU-ALN courses, and the requirement for revision of RRU-ALN courses to a 25-hour, competency-based hybrid format, there is an opportunity to launch additional micro-credentials in September 2022.

Initial discussions indicate the opportunity to add specialist programs to the initial Climate Adaptation Micro-credential. Specialist areas might include:

- Climate Adaptation: Leadership
- Climate Adaptation: Nature-Based and Green Solutions
- Climate Adaptation: Communication and Engagement
- Climate Adaptation: Financing
- Climate Adaptation: Infrastructure Resilience

Recent ALN evolutions include close collaboration with Climate Risk Institute (CRI) in advancing the adoption of the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Engineering Protocol, developed by Engineers Canada to establish and mediate the adaptive capacity of infrastructure, based on climate data. The Infrastructure Resilience Professional (IRP) Program offered by CRI, is a suite of continuing professional development courses that augment the courses offered through ALN. Subject to funding, CRI courses would be transformed into a hybrid delivery format through RRU Professional Continuing Studies (PCS), to be offered as part of a longer-term micro-credential roadmap.

More recently, ALN has partnered with the Academy for Sustainable Innovation (ASI) to explore research and program development initiatives. ASI's transitional leadership courses are also being integrated with ALN programs through RRU-PCS to offer a micro-credential for climate action practitioners that will be marketed to professionals across various employment sectors.

Climate change impacts are increasingly affecting the lives of all people, locally in British Columbia, across Canada, and worldwide. Drought, wildfires, extreme weather events, erosion from flooding, and sea level rise are all becoming more prevalent. Climate change impacts natural and built infrastructure and all communities, human health, and well-being. Consequently, there is growing awareness that professionals must be skilled in effectively responding to these climate impacts. Organizations need to integrate climate adaptation competencies into practice, and professionals working with governments and communities need to build reciprocal relationships to address climate change impacts.

The ALN team believes that there are multiple organizations across Canada that could be engaged to build a collaborative alliance, federation or cooperative structure that could bring together information, services and skill development opportunities that could be made widely available to professionals across the country with a need to upskill to address climate action.

The ALN team and existing partners (CRI, ASI) are interested in exploring whether a co-operative model might be a productive way of engaging founding partners and in bringing additional organizations to an umbrella group called CanADAPT.ca that provides a variety of services to professionals across Canada, and might also provide a mechanism for federal and provincial governments to fund further skills development in the climate action sector.

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