WEST HIGHLAND
GÀIDHEALTACHD AN IAR

WEST HIGHLAND COLLEGE UHI

STEM Strategy 2019-2022

University of the Highlands and Islands | Oilthigh na Gàidhealtachd agus nan Eilean
West Highland College | Colaiste na Gàidhealtachd an Iar

West Highland College UHI

STEM STRATEGY 2019-22

ELT manager	Principal & Chief Executive
Responsible officer	STEM Project Director
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First Review Date	October 2020
Date review approved by BoM	
Next Review Date	
Equality impact assessment	
Further information (where relevant)	

Reviewer	Date	Review Action / Impact	BoM

CONTEXT

The purpose of this strategy is to provide a clear understanding of West Highland College UHI's vision and ambition for how we will develop and deliver our STEM curriculum and services across the West Highland region to support our learners, employers and wider community.

The strategy has been developed in response, and is aligned to, Government national ambitions and initiatives and STEM Education and Training Strategy for Scotland 2017. It also takes close account of the University of the Highlands and Islands' (UHI) STEM strategy and plans and regional context for STEM development.

The strategy is aligned to the College Strategic Plan and is also closely linked with a number of other College key strategies and plans[2] all of which underpin the College ethos of **'Excellence for All'.**

OUR AMBITION FOR STEM

Our ambition is to deliver a STEM provision which is:

- Excellent
- Equitable
- Inspirational
- Connected

We aim to:

- Deliver high quality curriculum and services, aligned to industry needs
- Deliver a multi-disciplinary curriculum which reflects how people work
- Deliver curriculum which embeds employability and related transferrable skills for the workplace
- Continually improve and innovate in line with future technology and work practices
- Continually engage with industry and stakeholders

The strategy will ensure that all students studying STEM and related subjects at West Highland College UHI, regardless of their background or geographical location, will have access to consistent, high quality, tertiary STEM curriculum aligned with current and future job roles and employer requirements.

It will strengthen and create capacity to ensure employers have access to a skilled, occupationally competent, work ready, innovative and enterprising workforce through increasing the number of STEM learners and graduates, specifically those engaged in work-based learning through the SDS apprenticeship family.

It will assist employers in 'boosting productivity leading to inclusive growth, investment and innovation'[3] whilst meeting their wider business objectives and the region's economic priorities.

It will ensure that STEM skills will be key to the regions success and will be central to 'the regions ability to capitalise on growth opportunities and the associated economic and community benefits'[4].

We will achieve this by:

- Working in partnership – building on existing partnership working and collaborations with UHI, schools, employers and other stakeholders and developing ambitious new relationships.

- Enabling individuals to continuously develop their STEM skills by becoming enquiring, productive and innovative in order to grow STEM literacy in Society and drive inclusive economic growth, as outlined in the Scottish Government STEM Education and Training Strategy for Scotland 2017.

The measure of success of the West Highland College UHI STEM strategy will be the achievement of '**STEM Assured**' status through the STEM foundation.

STRATEGIC OBJECTIVES

The following 4 key objectives underpin this strategy:

Key Objective 1

To provide a range and depth of STEM provision. To do this we will

1. Develop and implement a stakeholder engagement plan

2. Undertake a stakeholder focused review, based on business requirement analysis technique (to identify business need and market intelligence to ensure STEM provision is connected to the dynamic labour market demand)

3. Develop relevant work-based learning pathways in all STEM sectors, supported by the college, to ensure it meets the needs of students, industry stakeholders and national priorities.

4. Provide clear articulation and progression pathways in STEM subject areas developing a tertiary STEM skills pipeline

5. In collaboration with industry, invest in facilities and equipment

6. Be flexible, continuously adapting as employers needs change

Key Objective 2

To foster innovative and inspirational high-quality transdisciplinary STEM learning. To do this we will:

1. Embed innovation, enterprise and entrepreneurship and skills for the future (meta-skills) in all programmes

2. Enhance staff professional practice, learning, knowledge, behaviors, qualities and capabilities to enable the design, development and continuous improvement of STEM programmes

3. Work in partnership with staff, students and stakeholders including employers, to design and create innovative learning and teaching activities and environments

4. Engage with technology and digital literacies to enhance opportunities for collaborative practice and adopt creative approaches to enhance learning, teaching and assessment

5. Provide a physical environment that facilitates collaboration between staff, students and stakeholders including employers

Key Objective 3

To address inequality and encourage diversity in STEM learning and careers, inspire, widen participation and remove real and perceived barriers.

To do this we will:

1. Increase the gender balance in in all STEM sectors supported by the college, specifically subject areas identified for improvement and action in the college's gender action plan

2. Support and encourage students to contribute to shaping the college's approach to achieving greater diversity in students studying STEM subjects

3. Work with stakeholders to address the specific issue of career gender stereotypes

4. Continue to have an informed approach based on data analysis, current research and good practice

5. Design, market and promote programmes to ensure equality of opportunity

6. To actively promote opportunities and benefits of STEM learning and careers utilising positive STEM role models to enthuse and mentor our students

Key Objective 4

To forge new and further strengthen innovative and sustainable partnerships with local authority, employers, and key internal and external stakeholders.

To do this we will:

1. Identify where there are current gaps in partnerships and develop an engagement plan with clear actions and objectives

2. Improve the support available in early years, primary, secondary schools and community learning locally by providing a college devised, employer endorsed structured STEM curriculum

3. Facilitate and engage with the development of regional curriculum planning between school, UHI and its academic partners

4. Work with the UHI STEM hub network to strengthen national and regional- level collaboration between partners, including schools, universities, science centers, Newton Room and employers

5. Create STEM clubs and build on STEM outreach already underway (computing for example)

6. Support partners in STEM engagement and participate in awareness raising with parents and the wider community

7. Engage with the STEM Ambassadors scheme, encouraging staff and students to become ambassadors

STEM CROSS CURRICULUM THEMES

Many of the objectives within STEM have a synergy in other areas of the curricuum. This STEM strategy should be used in cross curricular strategic and operational planning. Themes to be considered are:

- Meta Skills and Skills '4.0'
- Enterprise, innovation and entrepreneurship
- Employability, transition and Progression
- Digital literacy and Skills
- Applied Mathematics
- Contextualised embedded core skills
- Trans-disciplinary project-based learning

Appendix 1: **Definition of STEM**

From STEM Education and Training Strategy for Scotland 2017 What is STEM?
In the STEM strategy, we take a broad view of what STEM is:
STEM stands for Science, Technology, Engineering and Mathematics. We include numeracy and digital skills within our definition of STEM. Both of these are vital to enable everyone to participate successfully in society as well as across all jobs, careers and occupations. STEM education and training seeks not only to develop expertise and capability in each individual field but also to develop the ability and skills to work across disciplines through interdisciplinary learning.
STEM education and training helps us develop the following skills and capabilities:

- Growing our understanding and appreciation of the natural and physical world and the broader universe around us
- Interpreting and analysing data and information
- Research and critical enquiry – to develop and test ideas
- Problem solving and risk assessment
- Experimentation, exploration and discovery of new knowledge, ideas and products
- Collaboration and working across fields and disciplines
- Creativity and innovation – to develop new products and approaches

All of these are increasingly important to success in a changing and technologically- driven world.
They are also important for helping us to develop as active citizens, making informed decisions for ourselves and for society. We recognise, in particular, the importance of creativity and innovation for economic growth and the strong synergies that exist between STEM and creativity.

The separate disciplines of Science, Technology, Engineering and Mathematics can be defined as follows:

- Science enables us to develop our interest in, and understanding of, the living, material and physical world and develop the skills of collaboration, research, critical enquiry, experimentation, exploration and discovery.
- Engineering is the method of applying scientific and mathematical knowledge to human activity and Technology is what is produced through the application of scientific knowledge to human activity. Together these cover a wide range of fields including business, computing science, chemicals, food, textiles, craft, design, engineering, graphics and applied technologies including those relating to

construction, transport, the built environment, biomedical, microbiological and food technology.

• All of STEM is underpinned by Mathematics, which includes numeracy, and equips us with the skills and approaches we need to interpret and analyse information, simplify and solve problems, assess risk and make informed decisions. Mathematics and numeracy develops essential skills and capabilities for life, participation in society and in all jobs, careers and occupations. As well as providing the foundations for STEM, the study and application of mathematics is a vast and critical discipline in itself with far-reaching implications and value.

• Digital skills also play a huge and growing role in society and the economy as well as enabling the other STEM disciplines. Like mathematics, digital skills and digital literacy in particular are essential for participation in society and across the labour market. Digital skills embrace a spectrum of skills in the use and creation of digital material, from basic digital literacy, through data handling and quantitative reasoning, problem solving and computational thinking to the application of more specialist computing science knowledge and skills that are needed in data science, cyber security and coding. Within digital skills, as noted above, computing science is a separate discipline and subject

Definition of STEM Sectors Relating to West Highland College UHI

- Engineering
- Advanced Manufacture
- Built Environment
- Land Based
- Computing
- Maritime
- Aquaculture
- Applied Science
- Health

Appendix 2: **Related strategies and plans**

- STEM Education and Training Strategy for Scotland 2017
- STEM Education and Training Strategy for Scotland. First Annual report Feb. 2019
- Highlands and Islands Regional Tertiary Outcome Agreement 2018-19
- Highlands and Island's Regional Skills Investment Plan
- DYW: Scotland's Youth Employment Strategy
- Skills for Scotland: Accelerating the Recovering and Increasing Sustainable Economic Growth
- Curriculum for Excellence
- 15-24 Learner Journey
- Education Scotland: Career Management Standards and Work Placement Standards
- WHC UHI Strategic Plan 2016-21
- WHC UHI College plans and strategies:
    - Curriculum Strategy and Plan
    - College 3 year plan
    - STEM Curriculum Plan
    - Estates Strategy
    - Excellence for All
    - Learner Engagement Strategy o Access and Inclusion Strategy o Gender Action plan
    - Equalities plan
    - Essential skills
- UHI Strategic Plan 2015-20
- UHI Curriculum Strategies and plans
    - Computing
    - Engineering
    - UHI School of Health strategy and plans
- Highlands and Island's Regional Skills Investment Plan

Appendix 3: **Key Stakeholders**

- West Highland DYW Group
- Highland Council
- School Partners
- Employers (as defined in engagement plan)
- ESP
- UHI
- UHI Academic Partners
- Highland Science Skills Academy