

The Cartography of Curriculum

Mapping and Visualizing the Curriculum of a
Canadian Geomatics Masters Program

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Faculty of Forestry

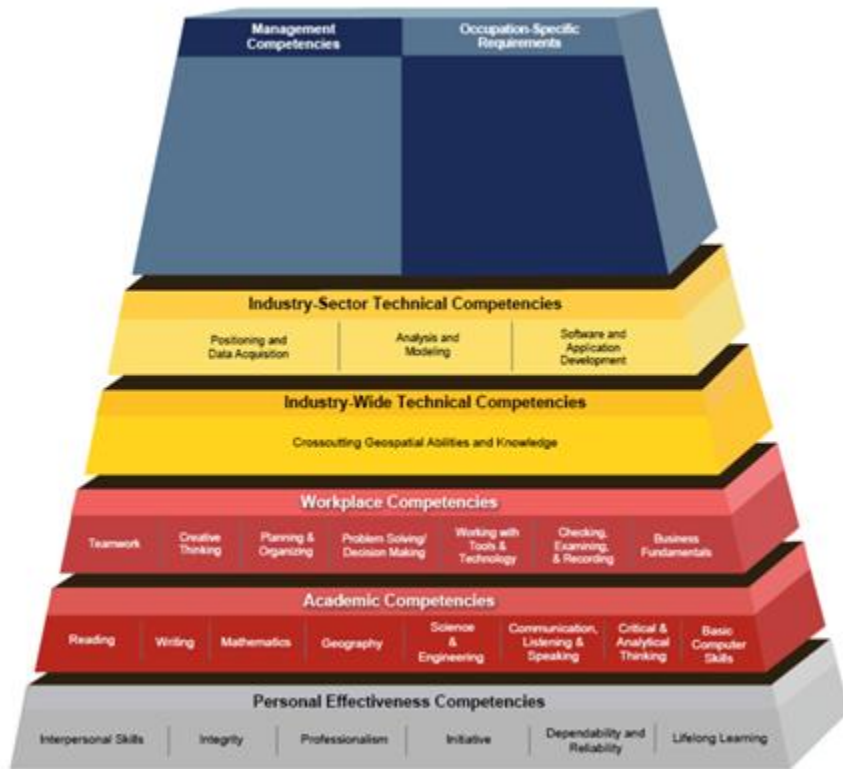
Master of Geomatics for Environmental Management (MGEM)

Professional masters program

- 9-month course-based curriculum
- 30 credits in GIS, remote sensing, data analysis, programming, spatial statistics, project management, communication, capstone project



Geospatial Technology Competency Model (GTCCM)



Competency Model

- Originally published by DiBiase et al (2010), updated in October 2023
- Describes 383 competencies, some derived from GIS&T BoK
- Competencies organized hierarchically under five tiers

This work includes information from the [Competency Model Clearinghouse](#), a website sponsored by the [U.S. Department of Labor, Employment and Training Administration](#) (USDOL, ETA), used under the [CC BY 4.0 license](#).

Approach

	A	B	C	D
1	Geospatial Technology Competency Model			
2				
3	Curriculum Analysis Worksheet			
4	Use the worksheet to identify the knowledge, skills, or abilities to include in your curriculum. Alternately, you can use the worksheet as a check sheet to indicate which competencies are not currently addressed by existing courses			
5		Courses (from curriculum)		
6	Competencies (from model)	Course 1	Course 2	Course 3
7				
8	Tier 1: Personal Effectiveness Competencies			
9	1.1 Interpersonal Skills: Demonstrating the ability to work effectively with others.			
10	1.1.1 Respecting diversity			
11	1.1.1.1 Interact appropriately and respectfully with supervisors and coworkers			
12	1.1.1.2 Work effectively with people who have diverse personalities and backgrounds			
13	1.1.1.3 Respect the opinions, perspectives, customs, and individual differences of others			
14	1.1.1.4 Be flexible and open-minded when dealing with a wide range of people			
15	1.1.1.5 Use appropriate strategies and solutions for dealing with conflicts and differences to maintain a smooth workflow			
16	1.1.1.6 Listen to and consider others' viewpoints			
17	1.2 Integrity: Displaying accepted social and work behaviors.			
18	1.2.1 Behaving ethically			
19	1.2.1.1 Treat others with honesty, fairness, and respect			
20	1.2.1.2 Respect the morals and beliefs of society			
21	1.2.2 Taking responsibility			
22	1.2.2.1 Take responsibility for accomplishing work goals within accepted timeframes			
23	1.2.2.2 Accept responsibility for one's decisions and actions			
24	1.3 Professionalism: Demonstrating commitment to the values, standards of conduct, and well-being of one's profession.			
25	1.3.1 Demonstrating self-control			
26	1.3.1.1 Stay calm, think clearly, and act decisively in stressful situations			
27	1.3.1.2 Accept criticism and attempt to learn from mistakes			
28	1.3.1.3 Refrain from substance abuse			
29	1.3.2 Maintaining a positive attitude			

Approach

Dimension of Teaching

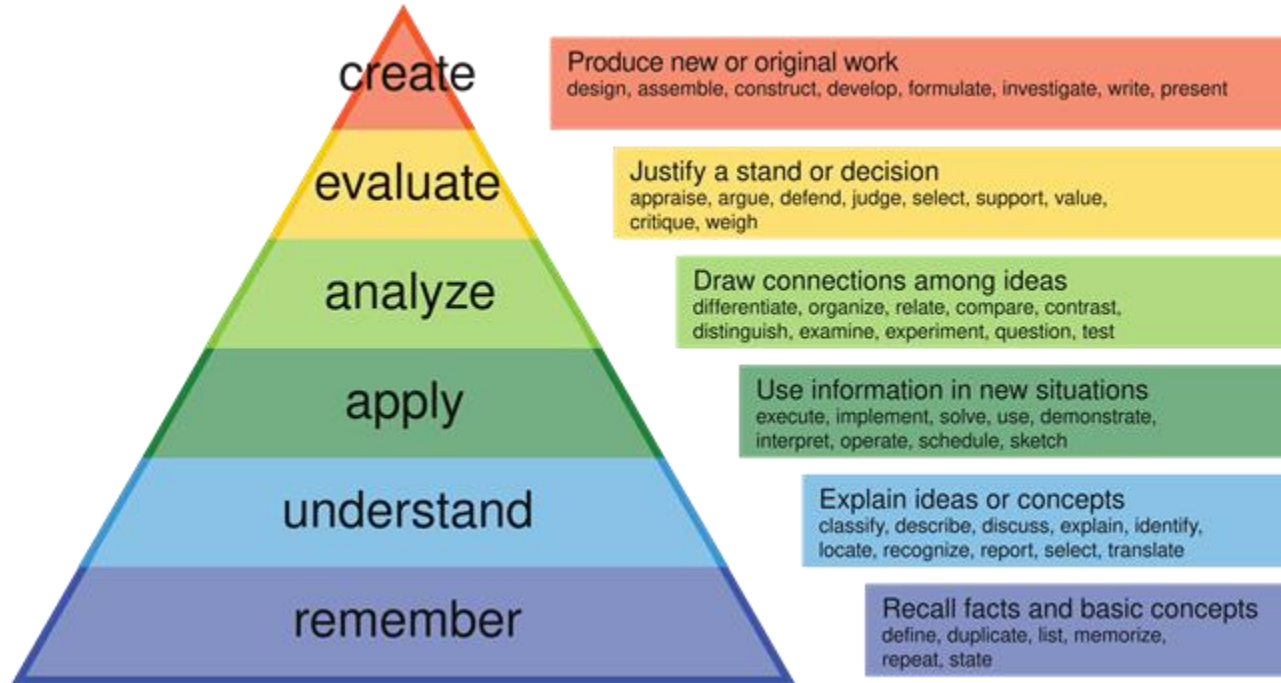
Code / Description

1. Not taught
2. Introduced
3. Reinforced
4. Proficient

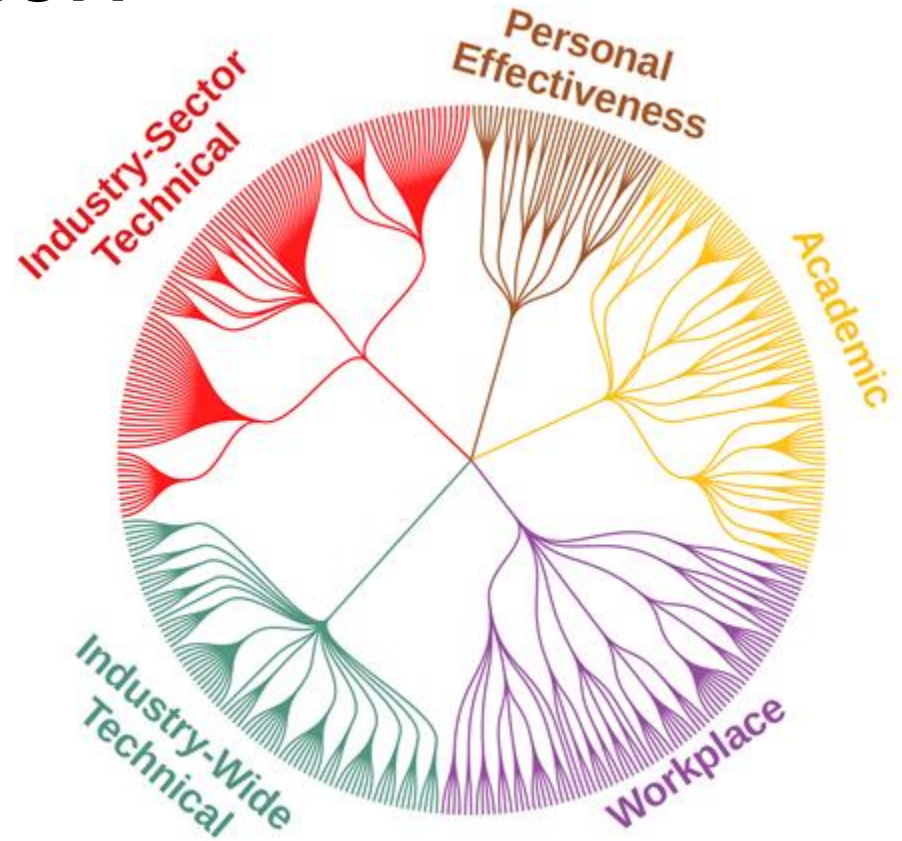
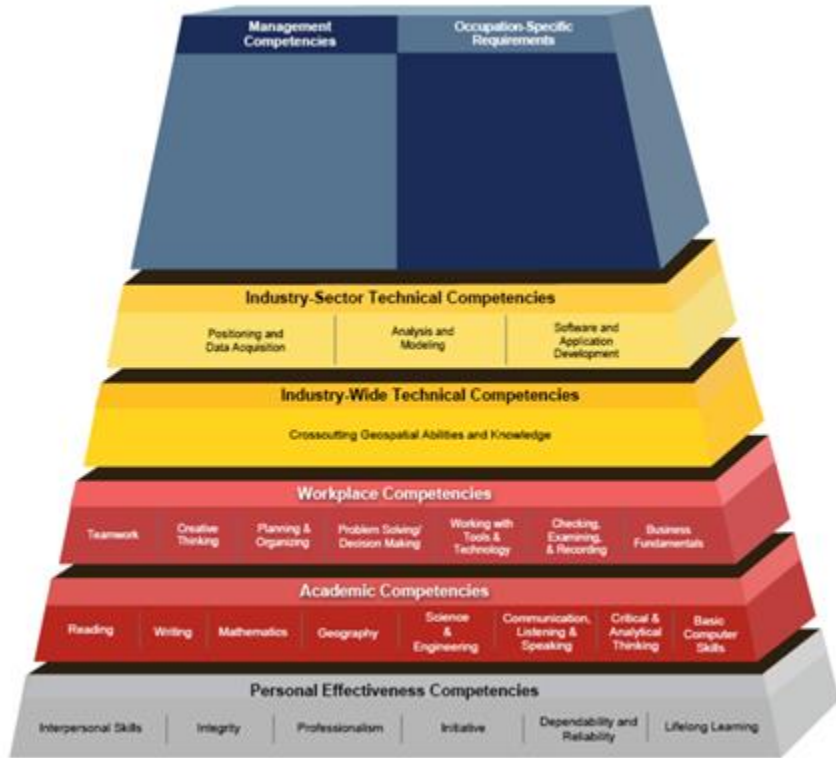
Dimension of Assessment

Code / Description

1. Not assessed
2. Understand / Comprehend
3. Use / Apply
4. Create / Evaluate



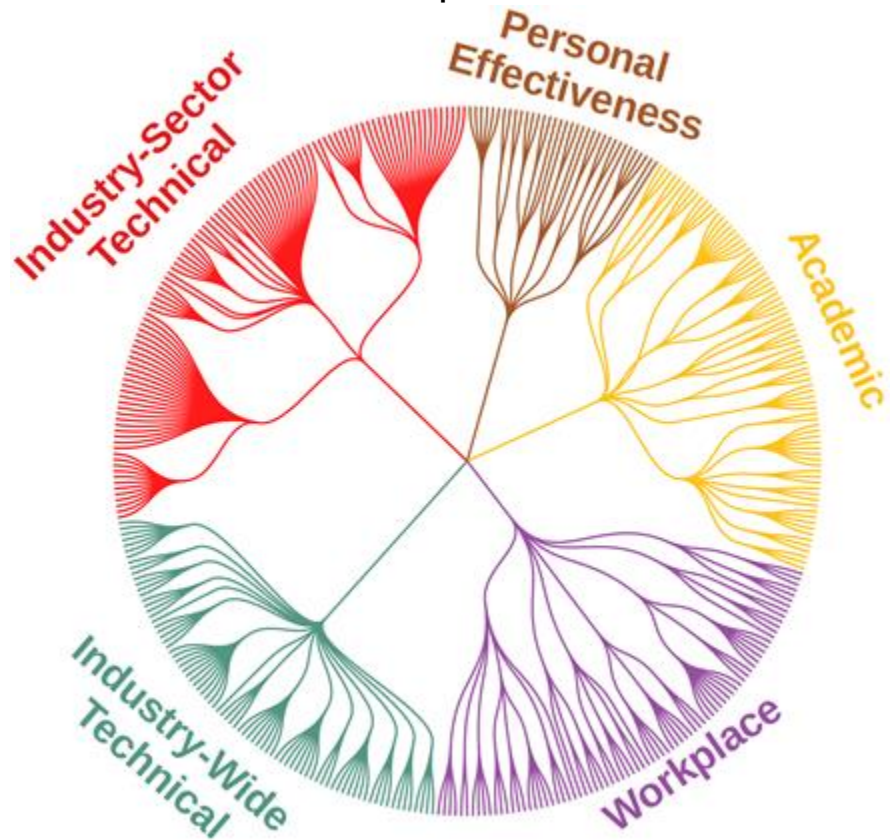
Approach



Full Competency Model

V = 509, E = 504

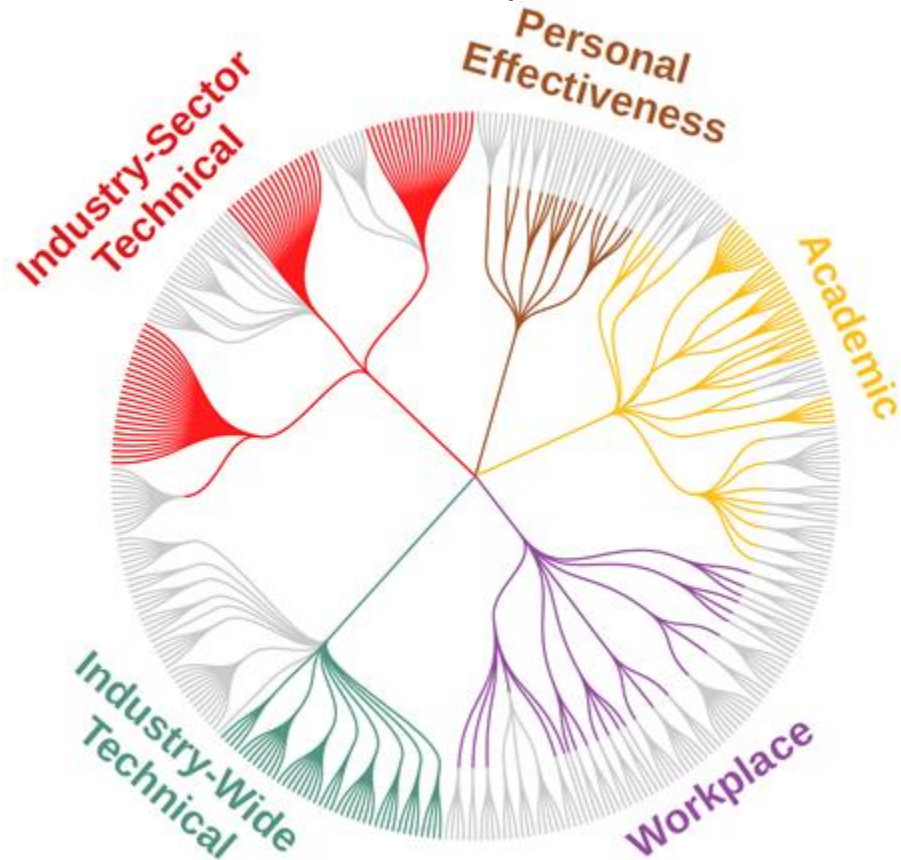
N = 383 competencies



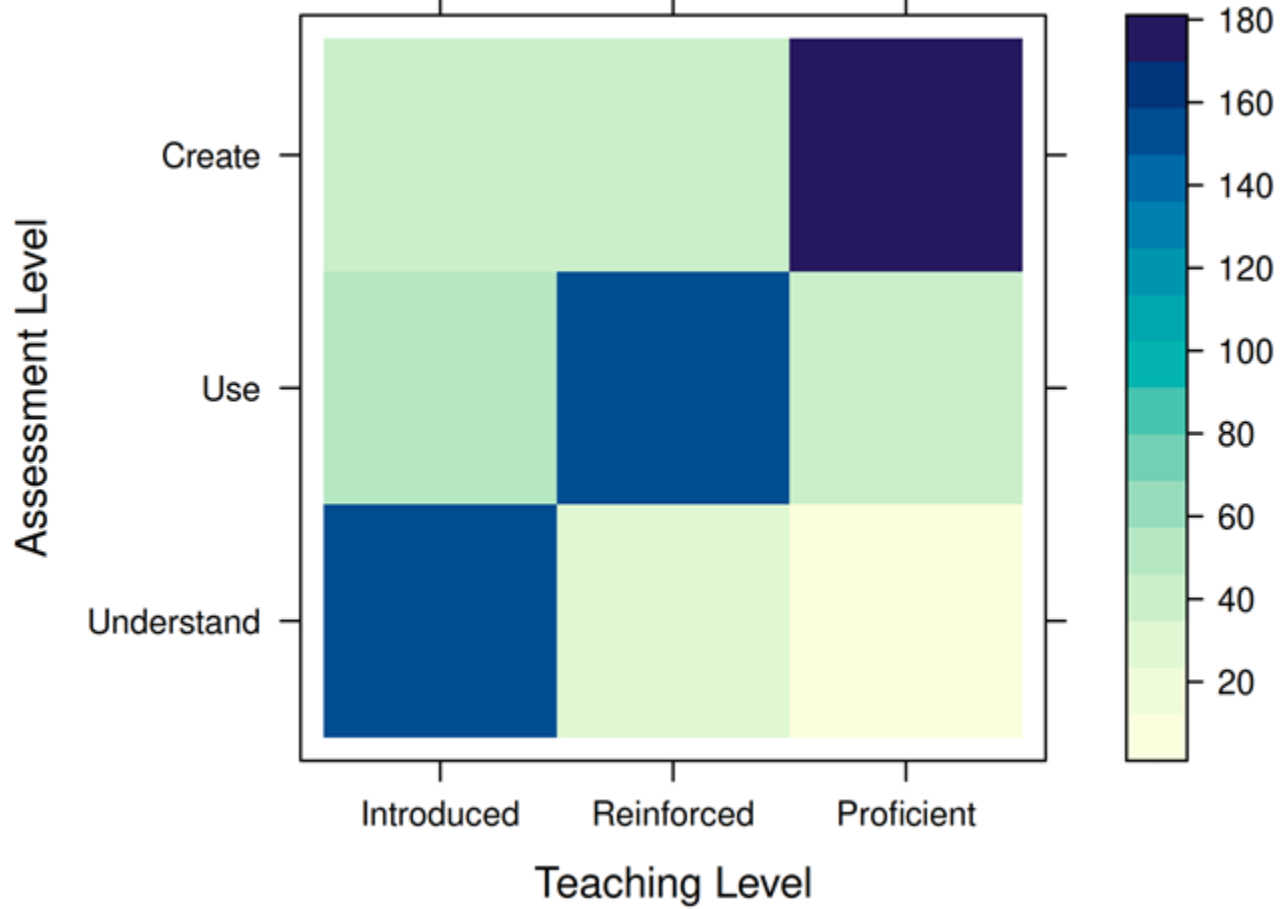
Evaluated Competency Model

V = 241, E = 236

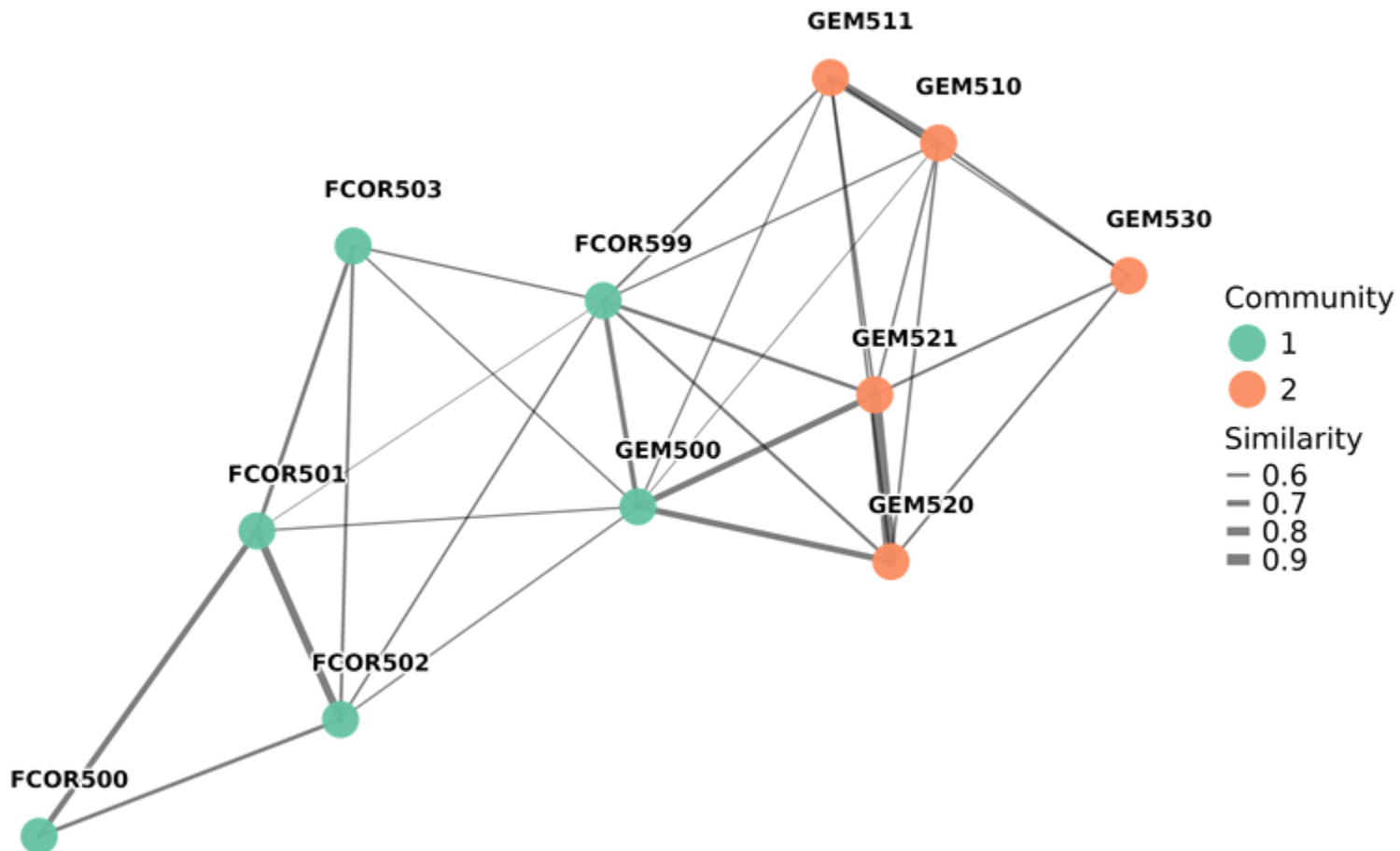
N = 211 competencies

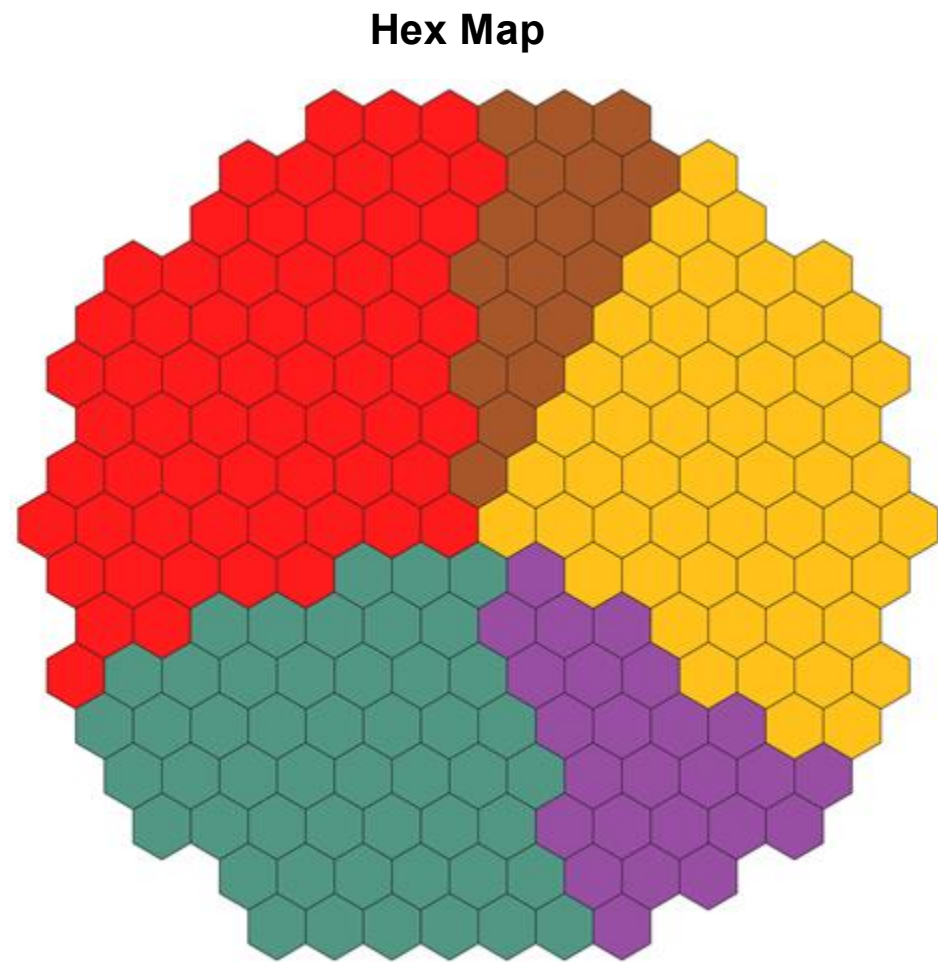
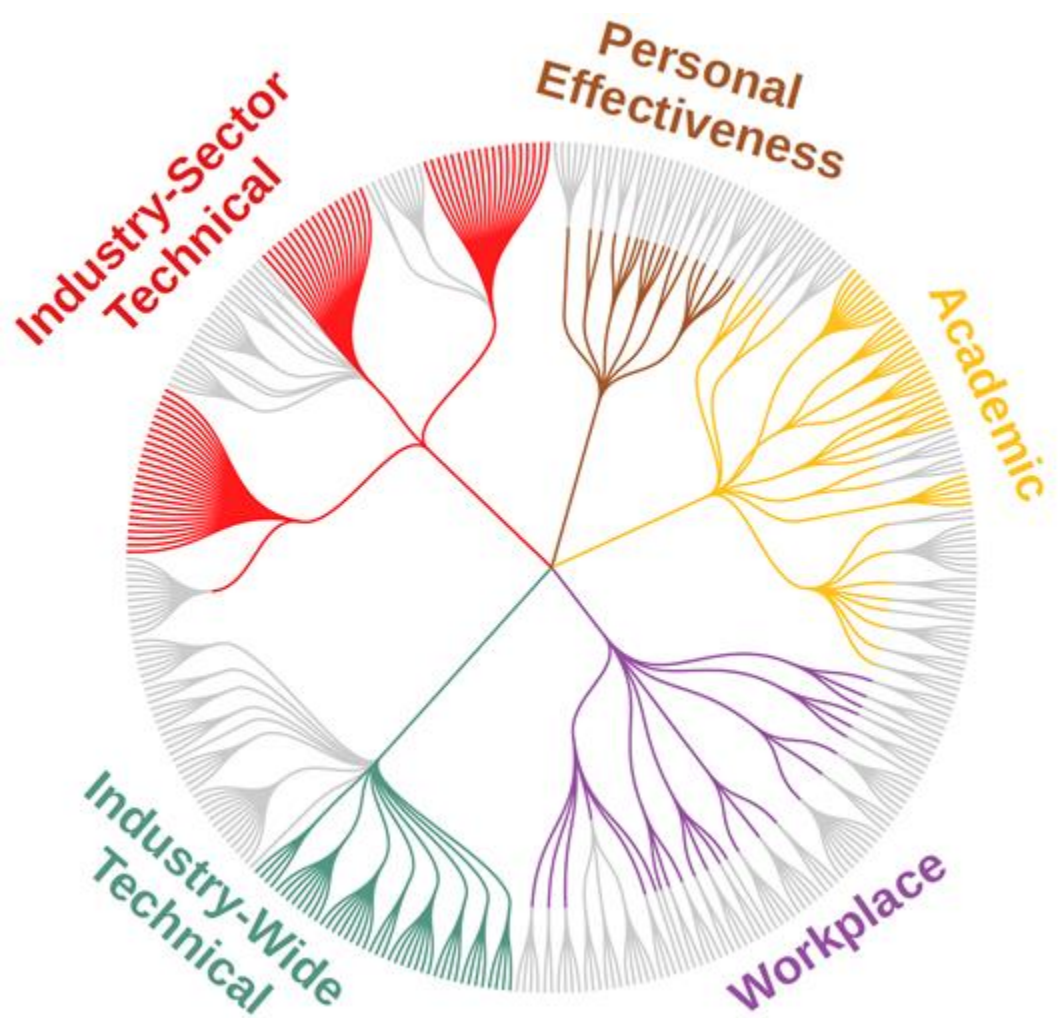


Competency Heat Map

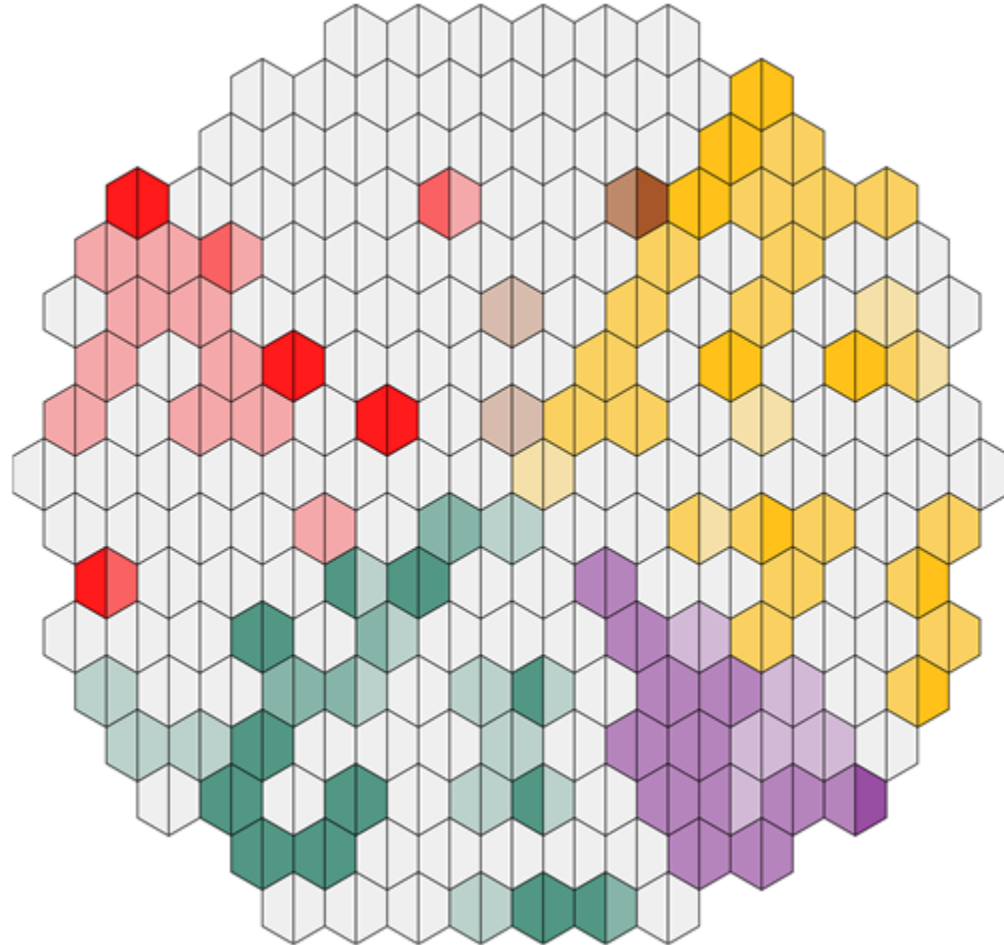


Course Similarity Network – Assessment (≥ 0.50)

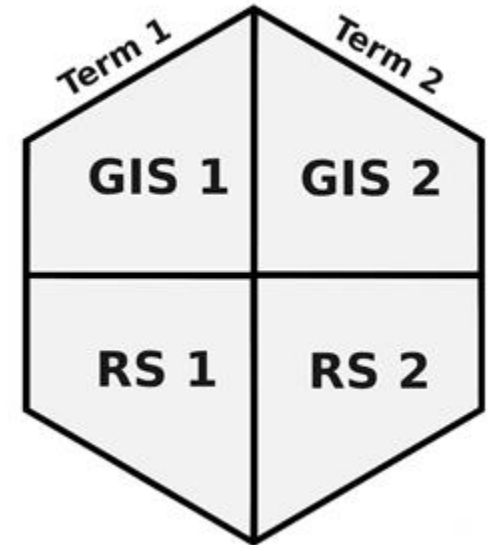
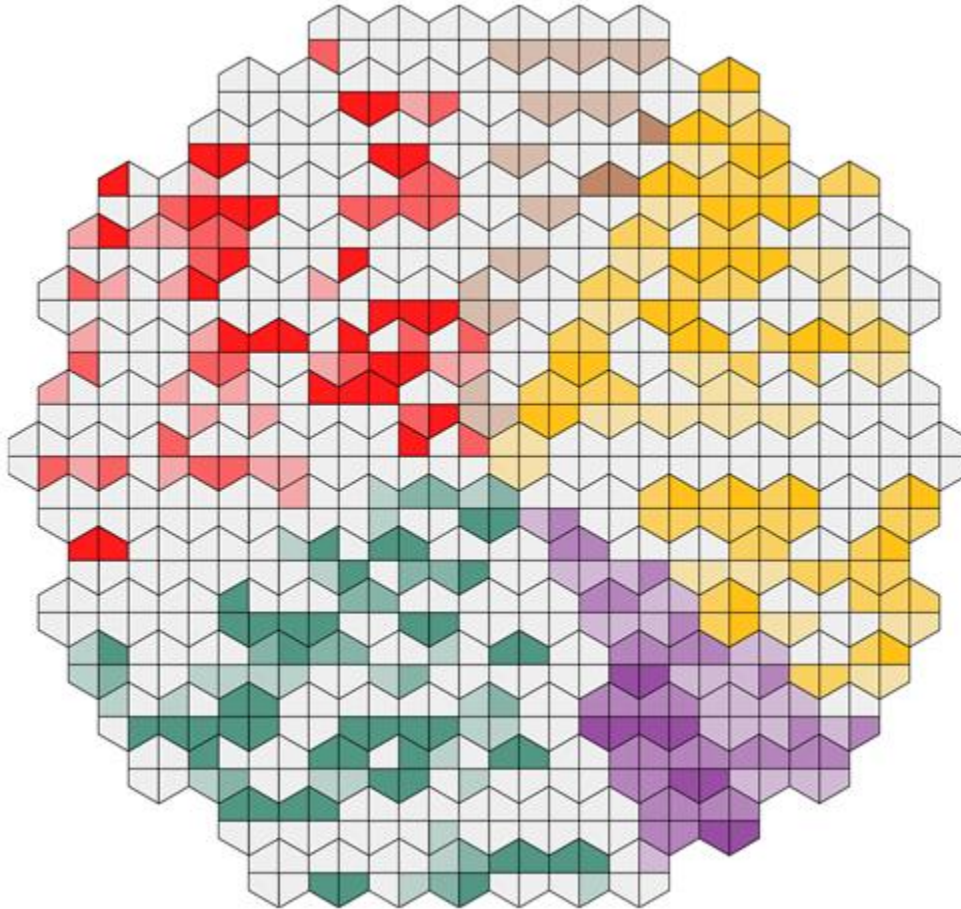




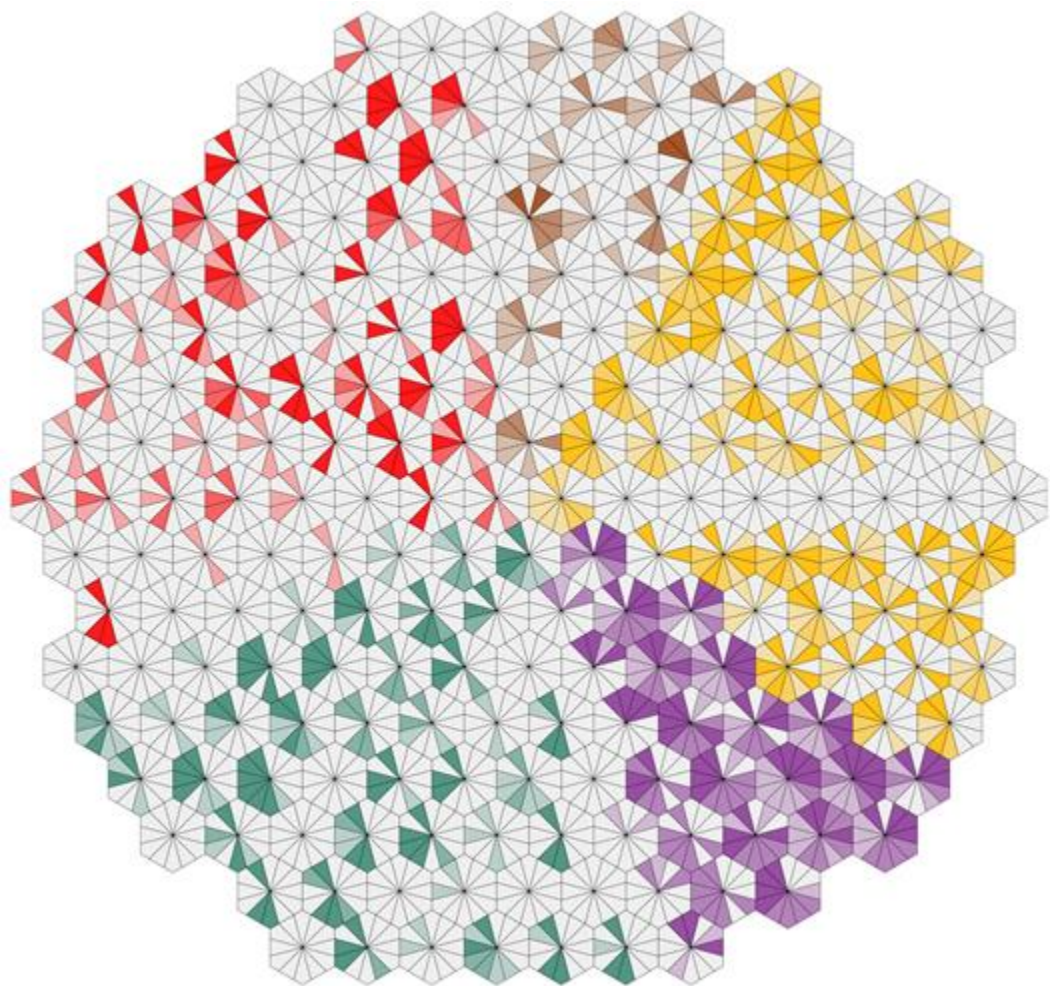
GEM 510 Hex Map – Teaching (Left), Assessment (Right)



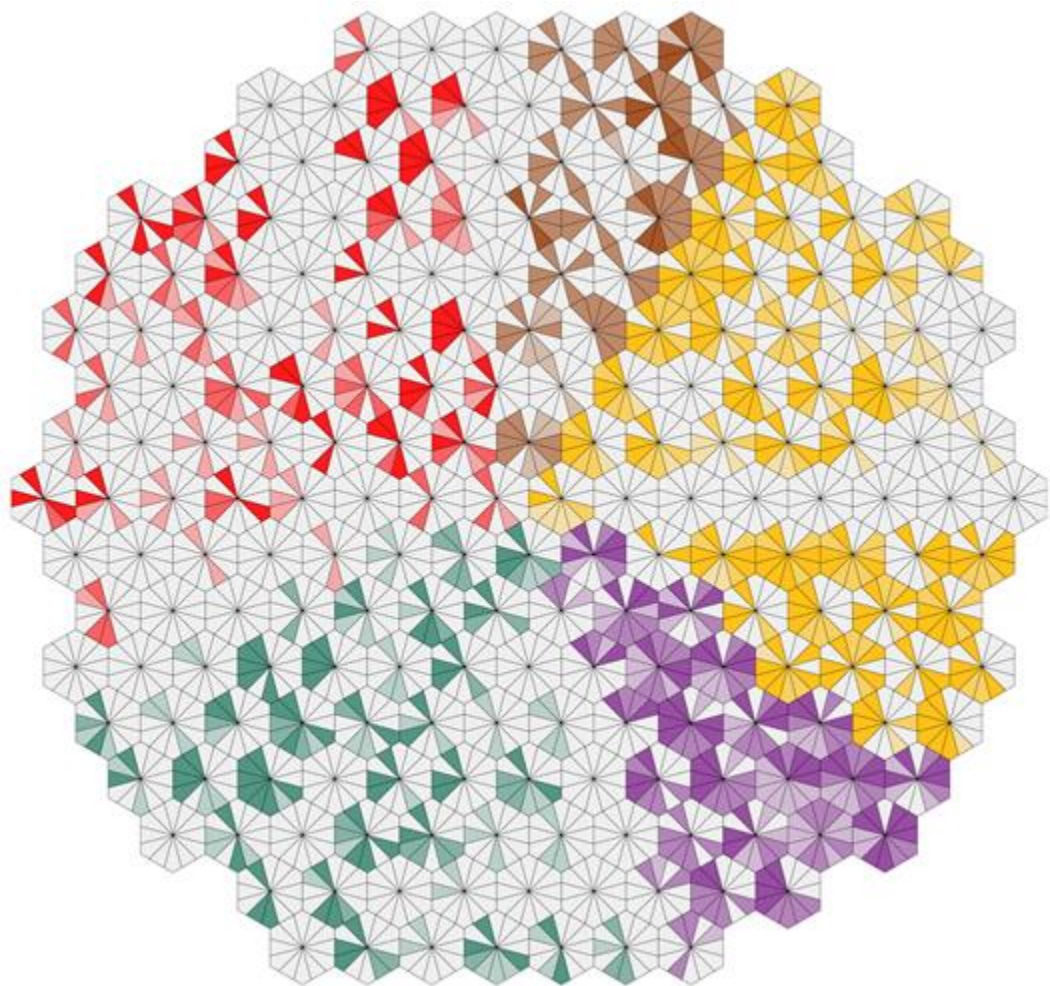
Four Courses Hex Map – Teaching

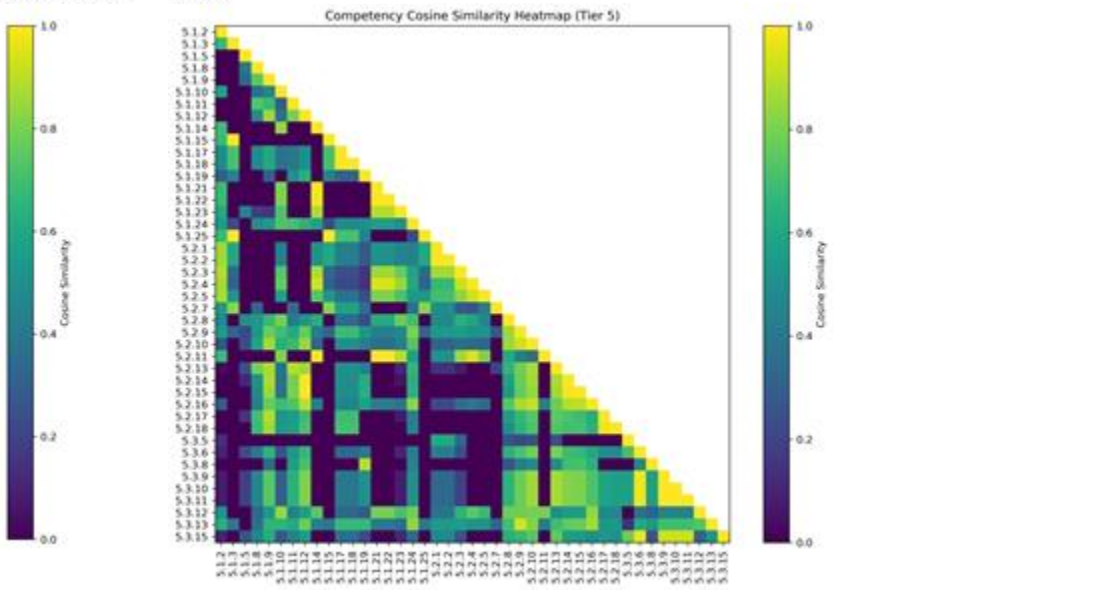
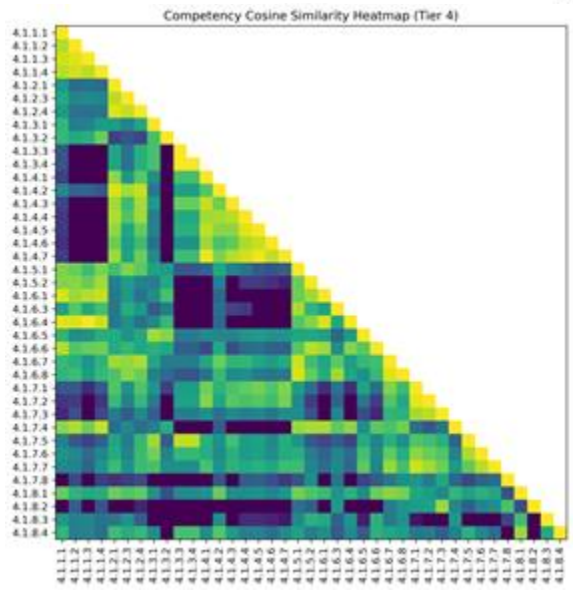
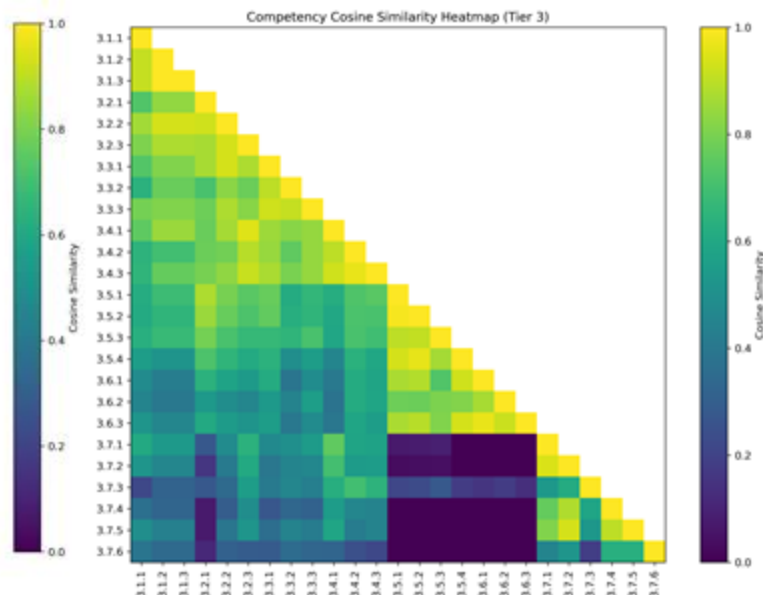
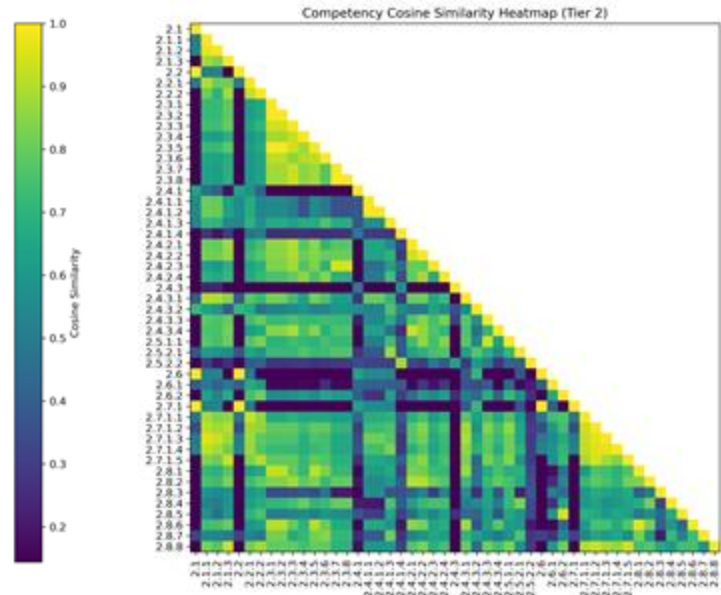
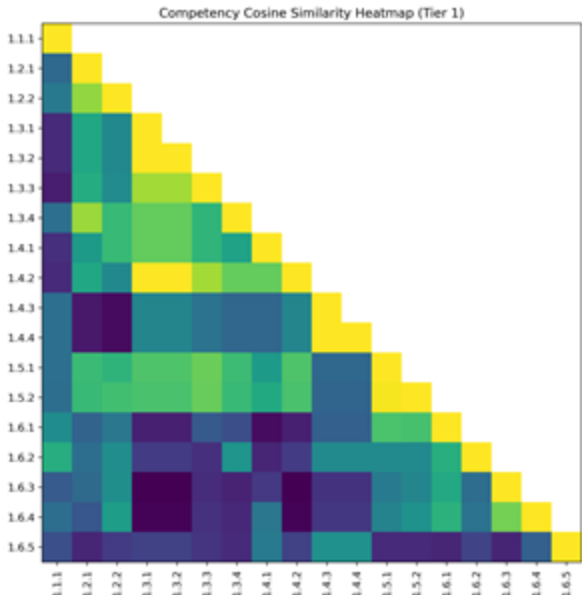


All Courses Hex Map – Teaching



All Courses Hex Map – Assessment





Interactive Competency Similarity Explorer (Teaching / Assessment)

Dimension
 Teaching Assessment

Similarity threshold (cosine \geq):
0.3 0.6 0.9
0.3 0.4 0.5 0.6 0.7 0.8 0.9

Top-k edges per node:
1 5 15
1 3 5 7 9 11 13 15

Show Tier (initial Tier 1):
1

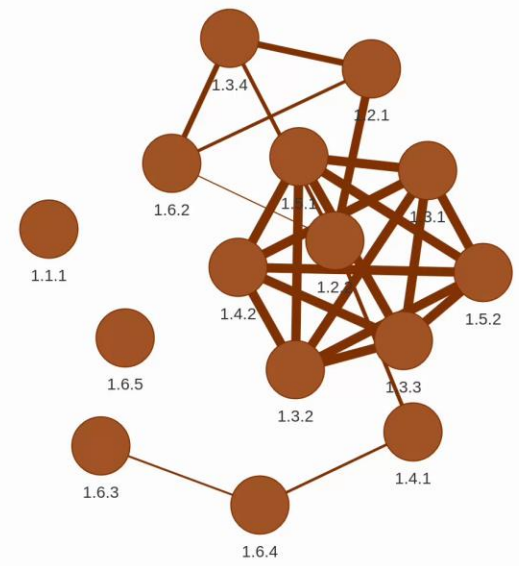
...or focus on a competency code (e.g., 401080400)

Update view

Unknown competency
No description available.

Select by id

- Tier 1
- Tier 2
- Tier 3
- Tier 4
- Tier 5



Thank You!
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Project library

<https://mgem-library.forestry.ubc.ca>

