Course Syllabus

Masters of Education Specialization
STEM LEADERSHIP
CENTRAL WASHINGTON UNIVERSITY

MATH 514 | Geometry for the Modern World

General Information

Modality: Hybrid

In-Person Location: January 7, 2023 (9-12pm) in Discovery 301

Instructor: Dr. Emilie Hancock (Please refer to me as Emilie or Dr. Hancock)

Office: Samuelson 218C | **Email:** emilie.hancock@cwu.edu | **Phone:** 509.963.2402

Office Hours: M 1-3pm in **DISCOVERY 301** (no appointment necessary). You can also **schedule an individual appointment (https://outlook.office365.com/owa/calendar/DrHancock@cwuwildcat.onmicrosoft.com/bookings/)** outside of office hours. Email me to schedule an appointment outside of work hours.

Materials

- **Canvas Access**
- **Textbooks:** References utilized in this course are *recommended* for your personal teaching library, but are *not required*. All assignment materials will be provided by the instructor.
  - Driscoll, M. (2007). *Fostering Geometric Thinking: A Guide for Teachers, Grades 5-10*. Heinemann.
  - Sinclair, N., Pimm, D., Skelin, M., & Zbeik, R.M. (2012). *Developing Essential Understanding of Geometry for Teaching Mathematics in Grades 6-8.* National Council of Teachers of Mathematics. Reston, VA.
  - Crites, T., Dougherty, B., Slovin, H., & Karp, K. (2018). *Putting Essential Understanding of Geometry into Practice in Grades 6-8.* National Council of Teachers of Mathematics. Reston, VA.
  - Sinclair, N., Pimm, D., & Skelin, M. (2012). *Developing Essential Understanding of Geometry for Teaching Mathematics in Grades 9-12.* National Council of Teachers of Mathematics. Reston, VA.
  - Ronau, R.N., Meyer, D., & Crites, T. (2015). *Putting Essential Understanding of Geometry into Practice in Grades 9-12.* National Council of Teachers of Mathematics. Reston, VA.

Disability Support Services

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. **Disability Services (https://www.cwu.edu/disability-services/)** serves students with permanent and temporary disabilities attending Central on the Ellensburg campus, online or at any of our eight University Centers. Their mission is to make university life accessible to students with disabilities. They work individually with students identifying barriers, and providing accommodations to ensure equal access. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations: Hogue Hall 126, 509.963.2214, **DS@cwu.edu. (mailto:DS@cwu.edu)**

Course Overview and Outcomes

Secondary teachers will collaboratively explore Euclidean and non-Euclidean geometries through the multimodal study of various transformations. They will discern spatial relationships and create geometric models of real-world and theoretical phenomena.

Upon successful completion of this **course (http://catalog.acalog.cwu.edu/)**, you will be able to:

- Propose and justify geometric conjectures using dynamic geometry software.
- Appraise and construct informal and formal proofs, attending to multiple geometric representations and principles of measurement.
- Create and revise geometric constraints to investigate dependence or independence of various parameters.
- Compare and contrast geometric invariants in Euclidean versus non-Euclidean geometries.
- Examine common student conceptions and misconceptions related to Euclidean and non-Euclidean geometries.

Learner Outcome	Assessment
Propose and justify geometric conjectures using dynamic geometry software.	In-class assignments, problem-solving portfolio assessed with a rubric
Appraise and construct informal and formal proofs, attending to multiple geometric representations and principles of measurement.	In-class assignments, problem-solving portfolio assessed with a rubric
Create and revise geometric constraints to investigate dependence or independence of various parameters.	In-class assignments, problem-solving portfolio assessed with a rubric
Compare and contrast geometric invariants in Euclidean versus non-Euclidean geometries.	In-class assignments, problem-solving portfolio assessed with a rubric
Examine common student conceptions and misconceptions related to Euclidean and non-Euclidean geometries	In-class assignments, problem-solving portfolio assessed with a rubric, activity/task mapping

Learning Performance Evaluation

A mixed approach will be used in this course to provide each student with opportunities for growth. Each assignment is described in detail in Canvas. Your performance will be determined using a point grading system:

Assignment Group/Benchmarks	Grade Weight (%)
Attendance and Professional Participation: In-Person Launch	10
Geometric Habits of Mind Problem-Solving Portfolio	
Problem 1: Reasoning with Relationships	10
Problem 2: Generalizing Geometric Ideas	10
Problem 3: Investigating Invariants	10
Problem 4: Balancing Exploration and Reflection	10
Essential Understandings	
Examine common student conceptions and misconceptions	20
Task Mapping 1	10

Task Mapping 2	10
Task Mapping 3	10
TOTAL	**100**

Grading Scale and Performance Characteristics

Final letter grades will be determined based on your weighted percent grade, rounded to the nearest whole percent.

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Percent	93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	0-59

Please see the Central Washington University Catalog for the eligibility requirements for an incomplete (I).

Course Expectations

Attendance Policy

Attendance is required for the in-person launch and is included as part of your course grade.

University Policy **CWUP 5-90-040(38) (http://www.cwu.edu/resources-reports/cwup-5-90-040-academic-and-general-regulations#Class%20Attendance%20and%20Participation)** provides for reasonable accommodation of student absences for religious holidays in accordance with **RCW 28B.137.010 (https://apps.leg.wa.gov/rcw/default.aspx?cite=28B.137.010)**. Students seeking reasonable accommodations under this policy must provide written notice to their instructors within the first two weeks of class specifying the dates for which religious accommodations are requested. Contact the Dean of Student Success at (509) 963-1515 for further information.

As a member of a peer learning community, a high degree of professionalism is necessary. CWU expects every member of the university community to contribute to an inclusive and respectful culture for all in its classrooms, work environments, and at campus events.

Intended Norms for Professional Participation[1]

Move Up/Move Back. Share air time equitably. Know yourself, balance your listening and talking.

Use Evidence to Support your Claims. Back what you have to say with data, readings, etc.

Speak Honestly. All perspectives are valued, and all perspectives are partial.

Value Differences. Remember that your perspective is not the only one.

Discomfort is OK. Identify your learning edge and push it. Take risks, make mistakes.

Make sure everyone feels safe. Safe is not the same as comfortable.

Own your impact. Your intentions may not be the same as your impact.

Anonymity. What's said (and by who) stays, what's learned can leave.

We're all in this together.

Academic Honesty and Student Conduct

Consult university policies **CWUP 5-90-040(25) (http://www.cwu.edu/resources-reports/cwup-5-90-040-academic-and-general-regulations#Class%20Attendance%20and%20Participation)**, **CWUR 2-90-040(24) (http://www.cwu.edu/resources-reports/cwur-2-90-040-academic-and-general-regulations#Academic%20Dishonesty)**, and **WAC 106-125-020 (https://apps.leg.wa.gov/WAC/default.aspx?cite=106-**

125-020) for student conduct, cheating, plagiarism, and other academic expectations. CWU's policies and recommendations for academic misconduct will be followed, leading to disciplinary action up to and including failing the course.

Central Washington University is committed to providing all community members with a learning and work environment that is free from sexual harassment and assault. Students have options for getting help if they have experienced sexual assault, relationship violence, and sexual harassment, or stalking. Information can be found at **http://www.cwu.edu/wecare (http://www.cwu.edu/wecare)** and in **CWUP 2-35-050 (http://www.cwu.edu/resources-reports/cwup-2-35-equal-opportunity-policies-and-programs#Harassment)** : Sexual Harassment. Faculty are required to report information regarding sexual misconduct or related crimes. Students may speak to someone confidentially by contacting the CWU Wellness Center, 509-963-3213, or the CWU Student Counseling Clinic, 509-963-1391.

Schedule of Course Topics

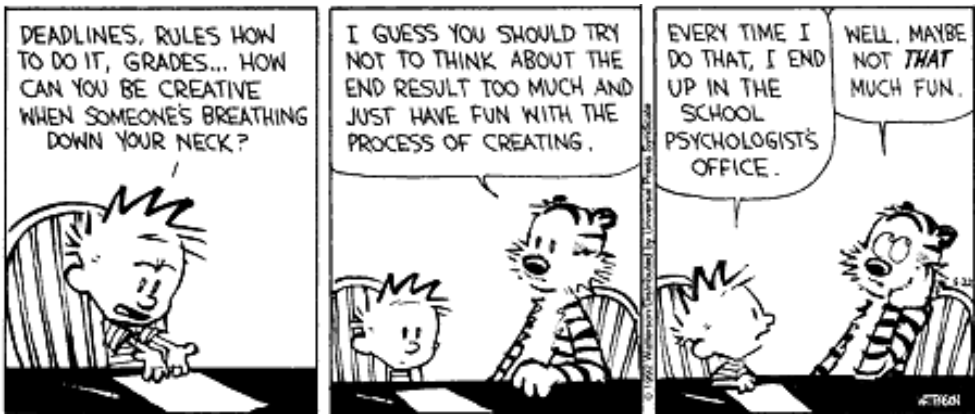
Week	Major Assignments Due
1 (Jan 7-8)	In-Person Launch (Driscoll CH 1)
2 (Jan 9-15)	Problem-Solving Portfolio Submission (Driscoll CH 2)
3 (Jan 16-22)	Problem-Solving Portfolio Submission (Driscoll CH 3)
4 (Jan 23-29)	Problem-Solving Portfolio Submission (Driscoll CH 4)
5 (Jan 30-Feb 5)	Problem-Solving Portfolio Submission (Driscoll CH 5)
6 (Feb 6-12)	Examine common student conceptions and misconceptions (Essential Understandings)
7 (Feb 13-19)	Task Mapping 1
8 (Feb 20-26)	Examine common student conceptions and misconceptions (Essential Understandings)
9 (Feb 27-Mar 5)	Task Mapping 2

10 (Mar 6-12)	Examine common student conceptions and misconceptions (Essential Understandings)
Finals Week	Task Mapping 3

Assignment deadlines available in Canvas.

Changes

I reserve the right to amend, adjust, or otherwise modify the syllabus at any time during the course.



References

1. Adapted from **Rifkin (2020).** (https://www.nsta.org/science-teacher/science-teacher-julyaugust-2020/who-does-science)