

Updated 2024

Fitchburg State University
EDUCATOR Programs
Comprehensive Syllabus

Semester Year: Summer II
(Course Prefix and Number)

Develop Cardinality and Number Sense with Whole-to-Part Icons of Quantity

1 Credit Hours

July 17-18, 2024

Number of Class Meetings 2 | Number of Contact Hours 10

Instructor: Christopher Woodin, Ed.M

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A. COURSE DESCRIPTION:

A student with dyslexia who is confused by typical math instruction can excel when instructed in a way that always shows the big picture first, uses visual-spatial images, and examines directly how the parts are connected to the whole. This program is quite different from how most of us were taught math, and it is different from most modern curriculum approaches, as well. Number sense is developed by establishing a robust understanding of quantities so that their values may be compared. The methodology to be presented enables such comparison by limiting demands on language processing, working memory, and executive function skills.

Learning and memory research tells us that multisensory integration is absolutely vital for children who have learning difficulties, as well as the best way to teach all students. Experiential, gross-motor activities provide a powerful approach to interact with recognizable whole-to-part visual models. Students develop language skills necessary to describe math concepts and relationships as they perceive and process them. Simply put, students take patterns apart, then reassemble them while describing the process. Various games and activities involving both fine and gross motor skills will be demonstrated, and supported with free online materials.

Upon completion, participants will be able to:

- Access and download online materials from the WoodinMath website for classroom use
- Demonstrate how to prompt a student to produce oral addition and subtraction facts using a visual, or tactile-kinesthetic prompt
- Demonstrate how to prompt a student to perform a regrouping step using patterns of base ten manipulatives
- Assess whether a student is functionally fluent within a given fact family.

If you plan on matriculating into a graduate program at Fitchburg State University, please be aware that twelve semester hours of Fitchburg State University credit taken within a year prior to the student's admission may be applied to the degree program with the approval of the program chairperson. Anything over 12 credits prior to matriculation will NOT be accepted towards the degree.

Students seeking Fitchburg State University course credit, must register with the university by the deadline given to them by their instructor. Instructions on how to register online for university credit will be provided by the course instructor/provider. Students seeking graduate credit must have earned a bachelor's degree prior to registering for graduate credit.

B. **TEXTS:**

Demystifying Math Struggles & Identifying Strategies to Help. Online Interactive article: <http://dyslexia.yale.edu/resources/educators/instruction/math-introduction/> Retrieved June 17, 2021. Website: The Yale Center for Dyslexia and Creativity: <http://dyslexia.yale.edu/>

Skagenholt M, Träff U, Västfjäll D, Skagerlund K. Examining the Triple Code Model in numerical cognition: An fMRI study. PLoS One. 2018 Jun 28;13(6):e0199247. doi: 10.1371/journal.pone.0199247. PMID: 29953456; [PMCID: PMC6023115](#). Retrieved 3.1.2023

Woodin, C. L., Ed.M. (2020, March 4). [The WoodinMath Number System](#) Retrieved May, 2021, from <https://docs.google.com/document/d/1Y2xmkQxBV8diqwhYVWU0YxJBj65GoIsu2OM9XiPFmY/edit?usp=sharing>

Woodin, C. L., Ed.M. (2018, January 3). [Develop Cardinality and Number Sense with Whole-to-Part Icons of Quantity](#). Retrieved May, 2021, from https://docs.google.com/document/d/1nm_psZiO2eOt1GUYxQh46hQGFROSe9Lnbhtbib3u2Bo/edit?usp=sharing

Woodin, C. L. (2014). [Multiplication and Division Facts for the Whole-to-Part, Visual Learner](#) (First Edition). Landmark School Outreach Program.

Woodin, C. L., Ed.M. (2021, May 14). Vertical Path and Primary Numeracy Sections, [WoodinMath Curriculum Bank Webpage](#) Retrieved May, 2021, from <https://www.woodinmath.com/curriculum-materials/curriculum-bank>

Woodin, C. (2000). [Visual images teach math](#). How durable images teach number sense Exchange, 18(2), 1-3. [Online] Retrieved March 06, 2021, from https://drive.google.com/file/d/0B9_-t4rbOBsCb19MUHlHRy1KQTA/view

Fitchburg State University Teacher Preparation Programs. (2018). *Conceptual framework*. Fitchburg, MA: Author. [Online] Available: <http://www.fitchburgstate.edu/offices-services-directory/education-unit/conceptual-framework/>

Massachusetts Department of Elementary and Secondary Education. (1999-2011). *Curriculum frameworks*. Malden, MA: Author. [Online] Available: <http://www.doe.mass.edu/frameworks/current.html>

Fitchburg State University Teacher Education Conceptual Framework



C. LEARNING OUTCOMES / OBJECTIVES:

This course will address the dispositions of the Conceptual Framework in the following way(s):

Knowledge: As a result of the learning experiences in the course, you will become more cognizant of: whole to part and part to whole processing models within the context of math instruction and the Massachusetts Math Curriculum Frameworks.

Skill: As a result of the learning experiences in the course, you will become better able to: compensate for executive function and working memory deficits by teaching math using whole-to-part strategies.

Caring: As a result of the learning experiences in the course, you will become more competent in your ability to: help a student be more confident in his math abilities by learning to individualize instruction to his specific learning style.

Ethical: As a result of the learning experiences in the course, you will become more competent in your ability to: teach the skills listed in the Massachusetts Math Curriculum standards to meet the specific learning needs and IEP goals of students with moderate special needs

D. INSTRUCTIONAL STRATEGIES:

<u>X</u> Lecture	<u> </u> Data Collection and Analysis
<u>X</u> Discussion/Questioning	<u> </u> Pre-Practicum
<u> </u> Laboratory	<u>X</u> Role Playing/Simulation
<u>X</u> Problem Finding/Solving	<u> </u> Independent Learning
<u> </u> Discovery	<u> </u> Field Trips
<u> </u> Interviewing	<u> </u> Computer Applications
<u>X</u> Collaborative Learning Groups	<u>X</u> Viewing or Listening to Followed by
<u>X</u> Reflective Responses	<u> </u> Discussing

Technology Initiatives:

Users of the Fitchburg State University technology systems are subject to all applicable federal, state, and international technology laws. Questions regarding regulations may be directed to the Office of Information Technology.

Candidates will utilize technology as a research tool to access online reading assignments and curricular materials and a communication method (to email correspondence and attached assignments).

E. COURSE REQUIREMENTS:

- Participate actively during activities and group discussions. Participants are required to attend all sessions of the course in a timely manner. Active participation is expected in discussions and activities.
 - Complete independent assignments:
1. **Reading & Reflection Paper:** Each graduate candidate will be responsible for writing one (1) one-page reaction paper that responds to reading assignments. These are not meant to be a paraphrased summary of the articles. The written assignment (reaction paper) will require the graduate candidate to demonstrate accurate knowledge of the material presented in the readings, as well as link the reading assignment to personal background experiences, or material presented in this course.
 2. **Peer Teaching Assignments:** Each student will be responsible for teaching two math lessons to a peer, and conversely, role-play to be taught as a student. Each graduate candidate will be required to demonstrate the use of manipulatives and teaching techniques to peers and the instructor. Two peer teaching demonstrations will be performed. Candidates will be graded based on their ability to teach a skill to a peer using effective cueing strategies, appropriate manipulative selection, appropriate use of methodology, dynamic response to student's needs, appropriate rate and clarity of presentation.

Possible lessons:

- a) Teach a student how to add using a non-sequential model. Identify or pre-teach the antecedent skills. Explain the assumed knowledge base of your student population.
- b) Using WoodinMath Icons, Teach a student to solve a subtraction problem similar to: $13 - 7$. Assume that your students have mastered missing addends to 10 ($7 + 3 = 10$).
- c) Teach a student to diagram and addition or subtraction word problem using a vertical linear diagram.
- d) Teach a student to correctly form an Arabic character in the proper orientation.

F. FIELD-BASED REQUIREMENTS: NONE

G. EVALUATION OR GRADING POLICY:

- Reading & Reflection Paper (1) - 50%
- Peer Teaching Assignments (2) - 50%

**FITCHBURG STATE UNIVERSITY
GRADUATE GRADING SYSTEM**

4.0	95 – 100	A
3.7	92 – 94	A-
3.5	89 – 91	A-/B+
3.3	86 - 88	B+
3.0	83 - 85	B
2.7	80 – 82	B-
2.5	77 – 79	B-/C+
2.3	74 – 76	C+
2.0	71 – 73	C
0.0	0 – 70	F
W	Withdrawn	
IN	Incomplete	
IP	In-Progress	

H. RUBRICS

Reading Reflection Paper				
Criteria	Ratings			Pts
Critical Thinking	Reflection reflects a great deal of critical thinking, analysis, and synthesis of material.	Reflection reflects adequate critical thinking, analysis, and synthesis of material.	Reflection lacked thought and insight. Student did not demonstrate synthesis of material.	50.0 pts
	50.0 pts	40.0 pts	30 pts	
Total Points 50.0 pts				

Peer Teaching Assignments Rubric

Rubric - Peer Teaching Assignments: [*Evaluation Form*](#)

Peer Teaching Demonstration #1: Maximum 25 points: 25% of final grade

Peer Teaching Demonstration #2-: Maximum 25 points 25% of final grade

Teaching Demonstrations will be rated individually and objectively.

Peer Teaching Assignments (2)				
Criteria	Ratings			Points
Employment of Effective cueing strategies	Cued the student with minimal, but effective verbal and/or nonverbal cues. 5.0 pts	Cued with marginally effective or inefficient verbal and/or nonverbal cues. 4 - 3.0 pts	Did not cue the student when necessary. 0 pts	/5
Appropriate selection and use of manipulatives	Selected and presented optimal materials within the CSA continuum. 5.0 pts	Selected appropriate materials within the CSA continuum. 4 - 3.0 pts	Did not complete the exercise. 0 pts	/5
Appropriate use of methodology	Demonstrated methodology efficiently. 5.0 pts	Demonstrated methodology with errors, or with diminished confidence. 4 - 3.0 pts.	Did not complete the exercise. 0 pts	/5
Dynamic response to student's needs	Responded to miscues with accurate prescriptive cue(s). 5.0 pts	Responded to miscues with repetitive or ineffective cue. 4 - 3.0 pts.	Did not complete the exercise. 0 pts	/5
Appropriate rate and clarity of presentation	Presented the lesson with clear, efficient language at an appropriate rate. 5.0 pts	Presented the lesson with relatively unclear or inefficient language, or at an inappropriate rate. 4 - 3.0 pts.	Did not complete the exercise. 0 pts	/5
Total Points 25.0 pts x 2 = 50 Points			TOTAL POINTS:	/25

I. COURSE CONTENT/TOPICAL OUTLINE:

Course Topic / Assignment	Content and Specifics	Relevant Date
Overview/Teaching Principles	Overview of Cognitive Metrics Within the Context of Math: Semiotics, Processing and Memory Systems. Support Neurodiverse Math Students TEDA3.17.24	Day 1 7/17/24
Introduction to the WoodinMath Website	Introduction to the WoodinMath Primary Numeracy Horizontal Path Curriculum Bank	Day 1 7/17/24

	Make Adapt Materials Reference Materials: Interactive Media , Print Media	
Stage 0 Horizontal and Vertical Paths	Readiness Skills: Basic Shapes and Icons 1 to 5	Day 1 7/17/24
Stage 1 Horizontal and Vertical Paths	Quantities 1 to 5: Google Form: Stage 1 Analysis Cardinality, Numeration, Comparison, Facts, Procedures, Applications	Day 1 7/17/24
Stage 2 Horizontal and Vertical Paths Applying Strategies	Quantities 1 to 10 Cardinality, Numeration, Comparison, Facts, Procedures, Applications <i>Requirements:</i> - Peer Teaching Assignment #1: 25 Points	Day 1 7/17/24
Stage 3 Horizontal and Vertical Paths	Decades to 100 and Quantities Through the Hundreds Place Cardinality, Numeration, Comparison, Facts, Procedures, Applications	Day 2 7/18/24
Stage 4 Horizontal and Vertical Paths	Sums and Differences Within 20 with Regrouping Numeration, Comparison, Facts, Procedures, Applications	Day 2 7/18/24
Stage 5 Vertical Path	Add and Subtract Within the 100s Place Procedures, Applications	Day 2 7/18/24
Applying Strategies	Peer Teaching Assignment #2: 25 Points	Day 2 7/18/24
Applying Strategies	<i>Requirements:</i> - <i>Reading & Reflection Paper: 50 Points</i>	Day 2 7/18/24

Fitchburg State University encourages all Extended Campus students to take advantage of our online student services. We have created a “virtual student center” just for you. Here you will find access to Counseling Services, Career Services, The Student Activity Center, the university bookstore and many other helpful links. You can access our student center by going to the university homepage at <http://www.fitchburgstate.edu> and clicking on Offices and Services. Scroll down and click on Extended Campus Center. You will find links to Library Services, our Virtual Student Center and other important information.

**FITCHBURG STATE UNIVERSITY
DISTANCE LEARNING & EXTENDED CAMPUS LIBRARY SERVICES**

The Gallucci-Cirio Library at Fitchburg State University provides a full range of library services including borrowing privileges; document delivery (books and articles mailed to your home); Interlibrary Loan; reference assistance via: phone, email, IM, Blackboard's Collaborate tools, Skype and in-person; library instruction via online and in-person at extended campus sites; research help and more. Any questions relating to library services should be directed to the E-Learning & Instruction Librarian, at 978-665-3062 or dllibrary@fitchburgstate.edu. There is also a special section for Distance Learning and Extended Campus Services at <http://fitchburgstate.libguides.com/dlservices> outlining the wide range of services available to you and how to access them. Activate your library account online through our ILLiad system at <https://fitchburgstate.illiad.oclc.org/illiad>; from here you can access articles, book, and media request forms to get items from our library and from other libraries. If you haven't used ILLiad before, you will need to click on the "First Time User? Create Your Account" link and set up your account.

Students who are currently registered with the university may access any of the library's subscription databases, including an increasing number with full-text, by visiting the Gallucci-Cirio Library's homepage <https://library.fitchburgstate.edu> and clicking on the Research Databases button in the center of the page. Select the resource you want to access from the alphabetical or subject listing. Once you click on the database title you will be prompted for your Falcon Key logon information; this is the same logon you will use for your Fitchburg State email account and if you have any online Blackboard courses. If you do not know your Falcon Key username and password or if you have any problems logging in, contact the university's Technology Help Desk at 978-665-4500 or helpdesk@fitchburgstate.edu. The Library can issue you a temporary guest login to access the library's databases while the Technology Department is setting up your account: contact us at 978-665-3062 or dllibrary@fitchburgstate.edu

All registered Fitchburg State University students are eligible for a Fitchburg State University OneCard ID which also serves as his/her library card. If you have not received your OneCard yet, you can still access all of our online services as long as you have activated your library account through ILLiad. After activation by the Gallucci-Cirio Library and receipt of your OneCard, students may access participating Massachusetts State College/University Libraries and you may request an ARC Card to access participating libraries in the Academic and Research Collaborative (ARC) during the current semester. OneCards are available on campus all year round. Students wanting a OneCard can find information on obtaining one at <https://www.fitchburgstate.edu/campus-life/campus-services/onecard-office> or present a course registration confirmation at the One Card Office in the Anthony Building of the main campus. Please call 978-665-3039 for available times or if you have any questions about your One Card.

UNIVERSITY AND EDUCATION UNIT POLICIES

Policy on Disability

Disability Services is the primary support system for students with disabilities taking classes in the day and evening divisions. The office is located on the third floor of the Hammond Building and can be reached at 978-665-4020 (voice/relay). If you need course adaptations or accommodations because of a disability, if you have emergency medication information, or if you need special arrangements in case the building must be evacuated, please make an appointment at the beginning of the course to talk with me. It is important that the issues relating to disabilities be discussed with me as soon as possible.

Attendance and Participation

1. As an emerging professional, you are expected to attend every class session, to be on time, and to communicate with the instructor regarding any absences. Absences and tardiness may result in a permanent grade change. Attendance at all pre-practicum sessions is mandatory.
2. Participation in class discussions and cooperative groups is expected. All candidates are responsible for meeting required deadlines on projects and assignments; your ability to complete tasks in a timely fashion demonstrates professional maturity and an ability to organize and manage time. Completion of assigned reading is imperative to your individual development as a professional.
3. All of these behaviors regarding attendance, preparation, and meeting deadlines are critical for successful teaching and thus are factored into the final grade.

Education Unit Computer Literacy Requirement

All assignments must be typed, doubled-spaced, and use APA format when appropriate. Refer to Internet Resources for Writing on the Fitchburg State University website for assistance.

You are expected to use word processing for all assignments (unless otherwise instructed). [If your course has other requirements list those also, e.g., 'You are expected to use email for dialogues with other class members, to examine the use of software in the field, and to use the Internet to obtain information, ideas and resources.']

Cellular Telephones and Other Devices

Kindly turn-off cellular telephones during class time and field experiences and place them in book bags or purses. Please no texting in class. It reflects negatively upon you as a developing professional. Once class begins and if use of the laptop is not required, all laptops should be closed during class time so that your full attention can be focused on your colleagues and the discussion or lecture in progress. If you prefer to take class notes on your laptop, please inform the instructor. You are on your honor to be focused on note taking and not on email, Facebook or other technological enterprise not germane to the class in progress. Thank you in advance for your consideration of colleagues and students.

Grade Appeal

If you disagree with the evaluation of your work or believe an improper grade has been assigned, an appeal may be followed. Please discuss the matter with the instructor and refer to the Fitchburg State University Grade Appeal Policy in the university catalog.

<https://www.fitchburgstate.edu/academics/courses-registration/university-catalog>

Academic Integrity Policy

The faculty in the Education Unit at Fitchburg State University that work submitted in fulfillment of course requirements will be solely that of the individual candidate and all other sources will be cited appropriately. University Academic Integrity Policy, as outlined in the University Catalog, will be strictly adhered to.

Copyright Policy

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